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THE JOURNAL

OF THE

American Medical Association

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 117, No. 13

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535 North Dearborn Street, Chicago, Ill.

SEPTEMBER 27, 1941

CONTENTS AND SUBJECT INDEX

Blood Coagulation. W. H. Howell, M.D., Baltimore 1059

Management of Scarlet Fever Contacts. P. S. Rhoads, M.D.; W. H. Tucker, M.D., and Benjamin Rappaport, M.D., Evanston, Ill...1063
Discussed by Drs. McCormack, Bullowa and Rhoads.

Treatment of Experimental Tuberculosis. H. C. Hinshaw, M.D., and William H. Feldman, D.V.M., Rochester, Minn. 1066
Discussed by Dr. Myers.

Implantation of Testosterone Pellets. Joseph Eidelsberg, M.D., and E. A. Ornstein, M.D., New York....1068

Sporotrichosis. Frank M. Gastineau, M.D.; Louis W. Spolyar, M.D., and Edith Haynes, Ph.D., Indianapolis 1074

The Effectiveness of Chemotherapeutic Agents in Malaria. L. T. Coggeshall, M.D.; John Maier, M.D., New York, and C. A. Best, Ancon, Canal Zone.....1077

Local Sulfonamide Therapy in Acute Mastoiditis. George S. Livingston, M.D., Chicago 1081

The Early Diagnosis of Acute Spinal Epidural Abscess. Saul Boharas, M.D., and Y. D. Koskoff, M.D., Pittsburgh 1085

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Bilateral Thrombosis of Anterior Cerebral Artery Following Stimulation of a Hyperactive Carotid Sinus. Judah Marmor, M.D., and M. R. Sapirstein, M.D., New York 1089

Carcinoma of the Lung. Béla Halpert, M.D., New Orleans.....1090

Dependence of the Cold Pressor Reaction on Peripheral Sensation. J. D. Sullivan, M.D., Albany, N. Y. 1090

SPECIAL ARTICLE

Syphilotherapy. H. N. Cole, M.D., Cleveland 1091

COUNCIL ON PHYSICAL THERAPY

Amputations in Diabetes Mellitus and Peripheral Vascular Disease 1095

EDITORIALS

Noncommunicable Streptococci..1098

The Duran-Reynals "Spreading Factor" 1099

Healing of Dental Caries.....1099

CURRENT COMMENT

Conservation of Vision.....1100

Efficiency of Gauze Masks.....1100

Congress Appropriates for New Army Medical Library.....1100

BUREAU OF LEGAL MEDICINE AND LEGISLATION 1116

MEDICAL PREPAREDNESS

Army Reserve Officers Ordered to Active Duty 1101

ORGANIZATION SECTION 1104

(Subject Index on next page)

THE STUDENT SECTION

Concerning Interns and Their Health. Reginald Fitz, M.D., Boston..1125
Discussed by Drs. Emerson, Diehl and Fitz.

Digests and Reviews.....1130

Do You Know What Physician— 1133

Medical College News.....1134

A. M. A. SESSION ATLANTIC CITY JUNE 8-12, 1942

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See Also SAUNDERS ADVERTISEMENT on Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "MI," Medicolegal; "ME," Medical Economics; "OS," Organization Section; "SS," Student Section.

A. M. A., Conference of Secretaries...OS-1104
Abscess, sulfanilamide locally.....ab-1121
Adrenals, hyperplasia in hypertension..ab-1118
Allergy and sneezing.....1140
Alpha Epsilon Delta.....SS-1136
American Academy of Ophthalmology and Otolaryngology.....1109
Review of Tuberculosis, Spanish abstracts.....1108
Social Hygiene Association disclaims film.1108
Amputations.....*1095
Androgens, implanting testosterone pellets.*1068
Antiserum for drug addict.....1141
Appendicitis in interns.....*1126
Army Medical Library.....E-1100
Arteries, coronary occlusion, silent.....ab-1117
Arteriosclerosis, amputations in.....*1095
cerebral, stimulating carotid sinus.....*1089
Association News.....1104
Association of Military Surgeons.....1103
Atrophy, muscular, vitamin E for.....ab-1124
Auricular Fibrillation, sweating in.....1142
Aviation, parachute oxygen unit.....ab-1119
flying in stratosphere.....1110
Bacteria, electronic microscopy.....ab-1123
filtering by gauze masks.....E-1100
Berryhill, W. R., made dean.....1108
Bevan Lecture by Dr. Ladd.....1106
Beveridge, T. F., 50 years of practice.....1107
Biochemistry, National Board questions..SS-1136
Blood coagulation problems.....*1059
pressure, cold pressor test.....*1090
pressure, high: adrenal hyperplasia...ab-1118
pressure, high, after pregnancy.....ab-1117
pressure, high, in Bright's disease....ab-1122
vessel disease, amputations in.....*1095
Board Examinations.....1115
Book Notices.....1137
Books Received.....Adv. page 34
Bowman, Karl M., named director.....1106
Boylston's smallpox inoculation in 1721..SS-1136
Breast cancer.....ab-1120
Bronchoscopy in lung abscess.....ab-1121
Brunner, A., appointment.....1111
Bureau of Investigation.....1113
Bureau of Legal Medicine and Legislation..1116
Burns, envelop method for.....1110
Canadian Medical Association.....1109
Cancer and leukemias.....ab-1123
Carlson, A. J.: fundamental sciences..SS-1131
Carotid Sinus, hyperactive, cerebral thrombosis after stimulating.....*1089
Casparis, H., lectures on pediatrics.....1106
Central Association of Obstetricians and Gynecologists.....1109
Clairmont, Dr., retired.....1111
Cleveland Health Museum, grants to.....1108
Cold, effects of.....1111
pressor reaction and peripheral sensation.*1090
College of Medical Evangelists.....SS-1135
Conjunctivitis, gonococcic, in children, sulfonamides for.....ab-1120
Corn meal and dental caries.....E-1099
Council on Physical Therapy.....1095
Cushing, Harvey, tribute to.....SS-1133
Deaths.....1112
Deaths of interns, causes of.....*1128
Dementia Paralytica, promin action on malaria therapy.....*1079
Diabetes Mellitus, amputations in.....*1095
Diet heals dental caries.....E-1099
Diphtheria, immunization.....1142
Drunkenness: tests; self-incrimination..MI-1116
Duco and dermatitis.....1142
Duran-Reynals "spreading factor".....E-1099
Dystrophy, muscular, vitamin E for....ab-1124
Eczema, immunize infant with?.....1142
Electron microscopy.....ab-1123
Embolism, heparin to control.....*1060
Encephalitis from mumps.....ab-1120
Endocrinology, Schering scholarships...SS-1134
Epidemic, noncommunicable streptococci..E-1098
Esophagus stenosis (upper).....ab-1118
European War, aid pharmacists.....1109
bomb damages University of London....1110
compensation for injuries.....1110
flying in the stratosphere.....1110
Fasciola hepatica.....1141
Fasciolopsis buski.....1141
Fauser, E. F., Stearns' president.....1108
Fellowships, Harvard.....SS-1134
Florists, sporotrichosis in.....*1074
Flukes, intestinal and liver.....1141
Foreign Letters.....1110
Furunculosis, sulfanilamide locally.....ab-1121
Gallbladder disease or liver flukes.....1141
Gangrene, amputations in.....*1095
Gauze masks, efficiency.....E-1100
Genitals, small, implant pellets.....*1068
Hair turning black after being white.....1140
Harvard scholarships; fellowships.....SS-1134
Health of interns.....*1125
services, state government.....OS-1104
Hemophilia, clinical control.....*1062
Hemorrhoids, rectal dilators for.....1142
Heparin, anticoagulant action.....*1059
Hernia, mesentericoparietal.....ab-1120
Homans, J., address at Yale dedication..SS-1133
Hospital, Paderewski, funds for.....1109
ward cars.....1103
Howard, F. H., 50 years in practice.....1107
Hyaluronidase, "spreading factor".....E-1099
Immunization program, Ia.....1107
Indiana University.....SS-1134; SS-1135
Industrial hygiene courses, N. Y.....1108
medicine committee, Canada.....1109
sporotrichosis in florists.....*1074
Infant with eczema, be immunized?.....1142
streptococcic epidemic.....E-1098
Infections, sulfanilamide locally for....ab-1121
efficiency of gauze masks.....E-1100
Influenza vaccine, students offered.....SS-1134
Information Please, what physician—..SS-1133
Injection, "spreading factor".....E-1099
Institute for Juvenile Research.....1106
of Hygiene, Ecuador.....1109
Internal Medicine, Swiss Society.....1111
Interns and their health.....*1125
Intestines flukes.....1141
small, mesentericoparietal hernia.....ab-1120
Ladd, W. E., Bevan Lecture by.....1106
Lenggenhager, K., appointment.....1111
Leukemias, neoplastic interpretation....ab-1123
Limbs, artificial.....*1097
Liver flukes.....1141
Long Island College.....SS-1135
Louisiana State, Bel award.....SS-1135
Lower Lecture.....1108
Loyola University.....1106
Lüscher, Erhard, succeeds Dr. Oppikofer..1111
Lungs abscess, bronchoscopy in.....ab-1121
cancer; 10 year survey.....*1090
congenital absence.....ab-1122
infiltration with positive Wassermann...1111
Lymph Nodes, cervical tuberculosis.....ab-1123
Malaria, promin and sulfadiazine for....*1077
control bureau, Florida.....1106
Marriages.....1111
Masks, gauze, efficiency.....E-1100
Mastoiditis, acute, sulfonamide locally in..*1081
Medical College of Virginia.....SS-1136
Medical Economic Abstracts.....1104
Medical Examinations and Licensure.....1115
Medical Legislation.....1103
Medical Preparedness.....1101
Association of Military Surgeons.....1103
Carlisle Barracks exempted.....1103
15 trainees in each 100 rejected.....1109
health supplies rating plan.....1103
hospital ward cars.....1103
nurses promoted to captains.....1103
officers ordered to active duty.....1101
Medical Service for transients.....OS-1104
Medicolegal Abstracts.....1116
Meetings, Coming Meetings.....1118
Meninges, subarachnoid hemorrhage....ab-1124
Mental Hygiene program, Minn.....1107
Microscopy, electron.....ab-1123
Migrants, illness of.....OS-1104
Mucolysin: "spreading factor".....E-1099
Narcotic addicts, sulfanilamide and antiserum for.....1141
National Board biochemistry questions..SS-1136
Nephritis, vicious circle in.....ab-1122
News.....1106
Oberhelman, H. A., Loyola appointment...1106
Obstetrics, graduate courses in.....1107
Oppikofer, E., retired.....1111
Organization Section.....1104
Oxygen unit (emergency parachute)....ab-1119
Paralysis, cold pressor reaction in.....*1090
Parotitis, epidemic, encephalitis after...ab-1120
Pediatrics, Dr. Casparis lectures on.....1106
Peptic Ulcer, Meulengracht's diet.....ab-1123
x-ray diagnosis of duodenal.....1140
Peritonitis, vaccination, irrigation and chemotherapy for.....ab-1121
Pharmacists, British, aid to.....1109
Pharmacy, 4 year course at Illinois....SS-1136
Phi Rho Sigma.....SS-1136
new initiate speaks.....SS-1130
Phosphorus, radioactive, sent to Ecuador...1109
Physicians ordered to active duty.....1101
what physician?.....SS-1133
Plague infection, Oregon.....1108
Pregnancy, syphilis in, treatment.....*1092
toxemias of, hypertension after.....ab-1117
Prize, Bel at Louisiana.....SS-1135
to Long Island seniors.....SS-1135
Promin treatment of malaria.....*1077
treatment of peritonitis.....ab-1121
treatment of tuberculosis.....*1066
Queries and Minor Notes.....1140
Rats, eradication campaign.....1106
Rector, F. L., goes to Michigan.....1106
Rectum dilators for hemorrhoids.....1142
Rockefeller Institute seeks patients.....1108
Scarlet Fever contacts, management.....*1063
immunization.....1142
sulfanilamide and antitoxin for.....ab-1120
Schering scholarships available.....SS-1134
Scholarships, Harvard.....SS-1134
Schering Corporation.....SS-1134
Sciences, fundamental, Dr. Carlson on..SS-1131
Secretaries, Annual Conference.....OS-1104
Sensation, peripheral: cold pressor reaction.*1090
Slander and Libel: physician; unlicensed practice charged.....MI-1116
Smallpox vaccination, first, in U. S....SS-1136
Sneezing mechanism and allergy.....1140
Society Proceedings.....1116
Sodium p,p'-diaminodiphenylsulfone-N,N'-didextrose sulfonate..*1066; *1077; ab-1121
Spine, acute epidural abscess.....*1085
lumbosacral intervertebral disks.....1111
Sporotrichosis in florists.....*1074
Spreading factor, Duran-Reynals.....E-1099
State Board Examinations.....1115
Stratosphere, flying in.....1110
Streptococcus, noncommunicable.....E-1098
Strongyloides, human infection with....ab-1124
Student Section.....1125
Students, Medical, loan funds.....SS-1134
new initiate speaks.....SS-1130
offered influenza vaccine.....SS-1134
Sulfanilamide for drug addiction.....1141
for gonococcic conjunctivitis.....ab-1120
for peritonitis.....ab-1121
for scarlet fever.....ab-1120
local use.....ab-1121
locally in acute mastoiditis.....*1081
Sulfapyridine in gonococcic conjunctivitis.ab-1120
Sulfathiazole, locally in acute mastoiditis.*1081
Sweating in auricular fibrillation.....1142
Swiss Society for Internal Medicine.....1111
Syphilis, treatment.....*1091
Teeth caries, rapidly developing.....1142
caries, dietary healing.....E-1099
Testis extract, "spreading factor".....E-1099
Thromboangiitis obliterans, amputations in.*1095
Thromboplastin in hemophilia.....*1062
Thrombosis, cerebral, after stimulating carotid sinus.....*1089
heparin to control.....*1060
Tissue extracts for hemophilia.....*1062
Tonics and Sedatives.....Adv. page 28
Trachoma, control of.....E-1100
Transients, illness of.....OS-1104
Tuberculosis, immunization, BCG.....ab-1119
in interns and residents.....*1127
pulmonary, hematogenous.....ab-1123
treatment, promin.....*1066
Tumor and leukemia.....ab-1123
Typhoid in vaccinated.....ab-1124
University of Alabama.....SS-1136
of Arkansas.....SS-1136
of California.....SS-1134
of Georgia.....SS-1135
of Illinois.....SS-1134; SS-1136
of London, bombing.....1110
of Maryland.....SS-1134
of Minnesota.....SS-1131
of North Carolina.....1108
of Tennessee.....SS-1135
of Vermont.....1108
Urticaria, congelation.....1111
Viruses, electronic microscopy.....ab-1123
Vision, conservation of.....E-1100
Vitamin B and neural disorders.....ab-1118
deficiency, multiple, syndrome.....ab-1118
E for atrophy and dystrophy.....ab-1124
K and blood coagulation.....*1059
Wassermann plus in lung infiltration.....1111
Waterhouse's vaccination in 1800.....SS-1136
Wayne University.....SS-1134; SS-1135
Whooping Cough, immunization.....1142
Woman's Auxiliary.....1105
Wounds, sulfanilamide locally.....ab-1121
envelop method for.....1110
Yale Medical Library, dedicated.....SS-1133

THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885 at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 117, NO. 13 — COPYRIGHT, 1941, BY AMERICAN MEDICAL ASSOCIATION CHICAGO, ILLINOIS — SEPTEMBER 27, 1941

RECENT ADVANCES IN THE PROBLEM OF BLOOD COAGULATION APPLICABLE TO MEDICINE

WILLIAM H. HOWELL, M.D.

BALTIMORE

For a generation or more it has been accepted by most of the workers in this field that clotting of blood takes place in two steps: first, the formation of thrombin from prothrombin and, second, a reaction between thrombin and fibrinogen which leads to the deposition of fibrin needles and the gelatination of the blood. The factors entering into these reactions are expressed in the schema first used by Morawitz, as follows:

prothrombin + Ca ions + thromboplastin = thrombin
thrombin + fibrinogen = fibrin

The schema is incomplete in that it fails to give the nature of the reactions in the two equations. On this point at present there is great diversity of opinion. It would be interesting to discuss the different views that have been proposed, but it would scarcely be profitable, since the weight of evidence at present does not incline to one view more than to another. Such a discussion, moreover, does not seem to be appropriate to the general purpose of this symposium. The schema is lacking also in another respect, namely that it fails to take into account the role played by the inhibitory substances of the blood and tissues as possible factors in the coagulation process. They do enter in an important way into the clinical applications that are being made of blood physiology, and I shall refer to them in some detail later on.

In the limited space allotted to this paper it is not possible to treat the subject exhaustively. I shall attempt only a brief presentation of the advance in our knowledge concerning three of the factors of coagulation and the bearing of this new work on clinical problems. Probably the most significant contribution to the subject of blood coagulation that has been made in recent years, certainly the one that has found most useful application in clinical medicine, is the discovery by Dam of the existence of a vitamin, vitamin K, which is essential to the formation of prothrombin. His first paper appeared in 1929, and subsequent work by himself and others has confirmed and supplemented his main conclusions. This discovery coincided with important work in this country by Quick, H. P. Smith and his co-workers and others on the effect of jaundice and injuries to the liver on the concentration of prothrombin in the blood. The relations thus suggested aroused general interest, and in a remarkably short time, through the cooperation of many laboratories, a new chapter in blood physiology was written concerning prothrombin under normal and pathologic conditions.

It is not necessary to give the chronologic development of this new knowledge. It will suffice to recall briefly some of the facts that have been established and that are indeed generally known to the medical profession, since they have been widely published in medical literature. The chemical nature of the vitamin has been determined and its synthesis in the laboratory has been accomplished. In this brilliant work the contributions of American investigators have been of major importance. The natural vitamin, vitamin K, is believed to be a methyl phytyl naphthoquinone, and a number of related compounds have been synthesized which show to varying degrees a similar activity in promoting prothrombin formation. Among these are some water soluble products which on account of ease of administration may prove to be of special therapeutic value. It has been shown that the presence of bile is necessary for the adequate absorption of the vitamin from the intestine and that its activity after absorption is exerted in the liver. Some older work (Drinker) indicates that prothrombin may be produced also in the bone marrow, but the evidence at present strongly favors the view that this function is performed mainly, if not entirely, by the liver. Structural injury to this organ produced by mechanical or chemical agents or as the result of pathologic processes is followed by a reduction in the output of prothrombin. Simple clinical methods have been devised to determine the relative concentration of prothrombin in the blood. The use of these tests and of more elaborate laboratory procedures have shown that certain well known hemorrhagic conditions are due to a fall in concentration of this factor. A reduction to 10 to 20 per cent of the normal is likely to be followed by hemorrhagic symptoms. Such a reduction may occur under conditions which affect the supply, the absorption or the utilization of the vitamin. In obstructive jaundice and biliary fistulas there is interference with absorption, owing to lack of bile in the intestine, and it seems probable that other diseases which affect intestinal functions, such as ulcerative colitis or sprue, may have a similar action. In cases of this kind in which liver function is normal administration of vitamin K suffices to restore prothrombin to the blood and arrest bleeding.

So far as I am aware no cases of prothrombinopenia in the adult have been reported as due to deficiency of

Read before the Section on Pathology and Physiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

the vitamin in the diet. The explanation given is that an intrinsic source of vitamin is furnished by the bacterial flora of the intestine which is sufficient to give an adequate supply when the diet itself is deficient or lacking in vitamin. In the newborn infant, however, it has been shown that within the first twenty-four hours after birth there is a fall in the prothrombin level of the blood, which is accepted now as the underlying cause of the hemorrhagic disease of the newborn. At birth the supply of prothrombin received from the mother's blood is adequate, but after some hours, owing to the normal consumption of prothrombin in the body, it drops to a critical level, owing presumably to a failure in supply of new vitamin in the diet, although there is the other possibility that there may be deficient absorption due to inadequate secretion of bile acids at this stage. Within a few days the prothrombin, under normal conditions, rises spontaneously to or toward a normal concentration, owing probably, as Quick suggests, to the prompt establishment of a bacterial flora in the intestine. If the return to normal is delayed, hemorrhagic conditions may develop, but these are readily obviated by administration of vitamin K. It is interesting to note that recent reports indicate that administration of vitamin to the mother before delivery prevents the postnatal drop in prothrombin in the infant's blood and thus wards off the danger of hemorrhage.

When the supply of vitamin is adequate and absorption is normal, prothrombin deficiency may occur if its proper utilization is retarded or prevented by serious damage to the structure of the liver. Under such conditions even massive doses of vitamin may be without effect on the prothrombin level of the blood. This fact has been demonstrated experimentally on animals and has been confirmed by observations on patients in whom there was extensive injury to the liver, owing to such conditions as thrombosis or cirrhosis. Out of this fact there may arise a new diagnostic method for the determination of liver function (Andrus). For, if a patient with lowered prothrombin fails to respond satisfactorily to administration of vitamin K, one may conclude that there is probably some organic disease of the liver.

The new information regarding prothrombin has had on the practical side unexpected and most gratifying clinical applications which must be reckoned among the really important advances in medicine. On the physiologic side there remain still many interesting problems to solve. The existence of prothrombin and its role in coagulation have been known since the time of Alexander Schmidt. He used the term some fifty years ago to designate the inactive antecedent substance which gives rise to active thrombin. Writers agree generally that it is a protein body, and several methods have been devised to obtain it in concentrated or purified form. It has, however, never been isolated in such a state of chemical purity as to make possible a wholly satisfactory determination of its structure. Analyses of a purified product recently reported (Seegers) indicate that it is a protein compound containing sulfur and a carbohydrate residue. Quantitatively it is present in blood in small amounts. According to one approximate estimate (Smith), it exists in human blood in a concentration of about 0.03 per cent, or 35 mg. per hundred cubic centimeters. Evidence accumulates to show that prothrombin is supplied to the blood from the liver. Total hepatectomy in the dog is followed by a rapid fall in the concentration of prothrombin in the blood. One must infer therefore that under normal conditions there is a continuous supply of prothrombin and an equally steady consumption somewhere in the body, since the average amount in the blood remains practically constant. According to a recent report (Andrus, Lord and Kauer), this consumption or disappearance of prothrombin takes place chiefly in the lungs. The authors connect this fact with the platelet formation in the lungs and assume that the new platelets, by liberating their thromboplastin in the lungs, cause the conversion of prothrombin to thrombin. This assumption seems to me to be unjustified, since such evidence as there is indicates that the platelets undergo disintegration in the capillaries of the body in general, particularly the systemic capillaries, and not especially in the lungs. The fact, however, that prothrombin and fibrinogen are being constantly consumed in the body does bring up the interesting question of what function is served thereby. One can hardly believe that this material is simply excreted. The natural assumption is that the prothrombin and fibrinogen react to form fibrin and that the fibrin subserves some special function; possibly, as Nolf suggested long ago, it undergoes proteolysis and furnishes nutrition to the cells, or possibly it protects the integrity of the capillary walls. On this point there is no actual information. It is a problem for the future.

Another important clinical application of coagulation studies is found in the attempts to use heparin to control thrombosis and embolism under pathologic conditions and after surgical operations. Several groups of workers have been engaged in these investigations, especially Best, Murray and their collaborators at Toronto and Jorpes and his colleagues at Stockholm. In the work of the Toronto group careful preliminary experiments were made on animals. They have shown that intravascular injections of heparin serve to prevent thrombus formation after mechanical or chemical injury to the lining of the blood vessels or heart and that arterial anastomoses, embolectomies and transplantations of organs may be performed after heparinization with less danger of thrombosis than in similar operations without heparin.

The application of these experimental results to clinical cases is in progress and the reports received so far are promising, although it is recognized that a larger experience with this mode of treatment is desirable. Murray reports 12 successful arterial embolectomies in which the patients were kept heparinized for from three to fourteen days after the operation; 50 cases of thrombophlebitis in which the treatment was followed by disappearance of pain, reduction in edema and relatively rapid recovery, with no return of symptoms after two years; 22 cases of massive pulmonary embolisms in which there was definite improvement and disappearance of symptoms; 4 successful cases of resection of a portion of the intestine after mesenteric thrombosis; 8 splenectomies in which there was absence of portal thrombosis, and 1 successful venous graft in a case of popliteal aneurysm. The most impressive results reported concern the effect of heparin in preventing postoperative thrombosis and embolism. The seriousness of this complication is generally recognized, and it occurs more frequently, perhaps, than has been assumed. Murray states that in the Toronto General

Hospital 10 per cent of postoperative deaths were due to pulmonary embolism and that an additional 10 per cent had symptoms referable to pulmonary embolism, which constituted probably a factor in the fatal termination. In this hospital heparin has been given after operation, by the method of continuous injection, in some 400 cases. In none of them was there any evidence of thrombosis or pulmonary embolism, although the cases selected for treatment included chiefly those involving operations in which experience has shown that thrombosis occurs with some frequency.

Similar results are reported by Crafoord and Jorpes from the Sabbatsberg's Hospital at Stockholm. In their work a control was established by collecting records of some 1,100 operations of the kind in which postoperative thrombosis is most often encountered. In 9 per cent of this group there was undoubted thrombosis, and in an additional 6 per cent thrombosis was probable as judged from symptoms. In 325 similar cases heparin was given after operation. Two hundred and fifty mg. a day was injected intravenously in four divided doses, beginning four hours after operation and continuing for from five to seven days. In this group there was no clear indication of thrombo-embolic symptoms.

Further data in regard to the results obtained by the Swedish workers are given in a recent number of the *Acta Medica Scandinavica* containing papers presented at a symposium on "Heparin and Thrombosis" held in Stockholm in December 1940. On the basis of his wide experience in the postoperative administration of heparin Crafoord states his belief that "it is definitely established that heparin is of the utmost value as a prophylactic against thrombosis after operations." In regard to its therapeutic effect in cases in which thrombosis has already developed, he feels that the evidence at hand is inconclusive. Other contributors to the symposium, however, expressed the opinion that heparin has a positive therapeutic value in clearing up the symptoms of thrombosis and in preventing spread and recurrence. An interesting contribution to this phase of the subject was made by Bauer. He has developed a method of making venographs of the veins of the leg which enable him to detect the early stages of thrombus formation before clinical symptoms are apparent. For this purpose he injects diodrast into a small branch of the saphenous vein and shortly afterward takes roentgenograms. The presence of a thrombus is revealed by filling defects in the veins roentgenographed. In 21 cases in which a thrombus was shown to be present, and in which heparin was administered, all symptoms disappeared within two to four days. In 32 similar cases in which heparin was not given results were much less favorable. Two patients died, 3 showed pulmonary embolism and 8 pulmonary infarct, and in 24 the thrombus grew until the entire femoral vein was involved.

In a recent report from the Mayo Clinic (Priestley, Essex and Barker) results are given for 55 cases in which heparin was used after definite symptoms of postoperative thrombophlebitis or pulmonary embolism had developed. Heparin was continued for ten days or more, and the authors report favorable results in that there was amelioration of symptoms and no recurrence of thrombosis. In cases of thrombosis of the central vein of the retina with its bad prognosis of ultimate blindness Ploman has used heparin with what he considers to be excellent results. From many sources, therefore, reports are being made which indicate that heparin may find a useful application in medicine after further experience has developed the conditions under which it can be used most effectively.

On the physiologic side work is still in progress to determine the origin, chemical structure and mode of action of heparin. The observations of Holmgren and Wilander give strong support to the view that heparin is produced in the basophilic mast cells which are found mainly in connective tissue, in the walls of the blood vessels and surrounding the blood capillaries. The granules in the mast cells give a distinctive staining reaction with toluidine blue identical with that shown by heparin, and chemically it has been found that the concentration of heparin in the various tissues runs parallel with the number of mast cells shown to be present. The work of Jorpes indicates that heparin is a mucoitin polysulfuric acid consisting of equimolecular parts of glycuronic acid and acetylated glucosamine, combined in ester form with sulfuric acid. Charles and Scott have succeeded in preparing a crystalline barium salt, and making use of their method Jaques has shown that the heparins from different mammals, in spite of similarity in chemical composition and crystalline form, have widely different potencies, that from the dog having ten times the anticoagulant action of heparin from sheep.

In our original paper Holt and I explained the anticoagulant action of heparin on the theory that it combines with prothrombin to prevent its activation to thrombin. We designated it, therefore, as an antiprothrombin in contrast with the antithrombin which is known to be present in blood plasma. We emphasized the fact, however, that when heparin is added to plasma or serum there is formed immediately a large amount of new antithrombin proportional to the quantity of heparin added. In other words, heparin reacts with some constituent of the blood to form an antithrombin. Subsequent workers have shown, apparently, that this reaction explains the anticoagulant effect of heparin. That is to say, purified preparations of prothrombin or thrombin are not directly inhibited or antagonized by heparin, but when this substance is added to blood it combines or reacts with some substance in the plasma to form an inhibitory compound which has the known properties of antithrombin. It can neutralize thrombin, if present, or can prevent the conversion of prothrombin to thrombin. Quick has identified the component of the plasma on which the heparin acts as a fraction of the serum albumin complex, the so-called heparin complement. On the basis of these results one might assume, theoretically, that the antithrombin present normally in blood plasma is in reality a heparin albumin compound whose presence is insured by the constant secretion of small quantities of heparin into the blood. It is known quite definitely that in peptone shock or anaphylactic shock there is a secretion of heparin into the blood in amounts sufficient to decrease its coagulability or to render it wholly incoagulable.

This inhibitory factor is not usually taken into account in theories of coagulation. Some of the older writers, Nolf, Bordet and others, make reference to it but do not include it in their schemata of the coagulation reactions. It is an important feature of my theory, and it would appear that recent work tends to support the view that this inhibitory substance, heparin or the heparin-albumin complex, is concerned in maintaining normal fluidity of the circulating blood.

Clinical control of the hemorrhagic condition due to hemophilia has made less progress. It has been shown that in hemophilia there is no lack of prothrombin; therefore in such cases administration of vitamin K is without effect. Recent work, in fact, indicates that all the factors of coagulation are present in normal concentration in hemophilic blood with the exception of thromboplastin. The older workers were aware that addition of a little normal blood or blood plasma or tissue extract to hemophilic blood restores its coagulation time to normal limits. Hence the efficacy of blood transfusions in the control of hemophilic bleeding. The substance in blood that exerts this action has been separated out by acid precipitation by Patek and his co-workers and by Bendien and Van Creveld, and they have shown that it is present also in hemophilic blood, but in smaller amounts. This is one difference between normal and hemophilic blood that has been definitely established. It is a thromboplastic substance, or, for short, a thromboplastin which in all probability is similar to or identical with the thromboplastin of the tissues.

The smaller amount of thromboplastin in hemophilic blood may be explained on theoretic grounds as due to the abnormal stability of the hemophilic blood platelets, since there is good reason for believing that the thromboplastin in normal blood is derived from the disintegration of blood platelets which is constantly taking place in the circulation, and the more rigid platelets of hemophilic blood with their slower disintegration might well be responsible for the lower concentration of thromboplastin in this blood. Certainly any increase in the thromboplastin of hemophilic blood in vitro serves to shorten its coagulation time. From this point of view, the fundamental trouble with the hemophilic is this abnormal stability of the blood platelets, as was first suggested, I believe, by Minot and Lee, and it may be noted that this defect not only entails a slower coagulation time but probably tends to prolong bleeding from wounded vessels, owing to defective thrombus formation. Since the blood platelets originate in the cytoplasm of the megakaryocytes and are thrown off from them into the circulation, one might be justified in defining hemophilia as essentially a congenital dysfunction of the megakaryocytes. A view of this kind gives a possible basis for an explanation of the obscure relation between hemophilia and purpura, in some cases an alternating relation, which has been referred to by several authors.

Since tissue extracts added to normal or hemophilic blood in vitro hasten its coagulation, it is to be expected that attempts would be made to control hemophilic bleeding and hemorrhage from other causes by intravenous injection of such extracts. Numerous experiments of this kind have been made, but the results on the whole have not been successful, partly perhaps because in some cases the hemorrhagic condition treated was not due to deficiency in thromboplastin and partly because of the danger of intravascular clotting or serious protein reactions. In most cases relatively crude extracts have been used which contained other substances in addition to thromboplastin itself. It remains possible that if the thromboplastin were isolated in pure form it could be used intravascularly in graded dosage in hemophilia to restore the normal thromboplastin level of the blood. The preparation of pure thromboplastin, which is the active substance in tissue extracts, has not yet been accomplished nor is it known for certain what its chemical structure is. Usually it is assumed to be a protein-phospholipid complex, but this view, although probable, has not been definitely established. Cohen and Chargaff have published recently a method of isolating what they designate as the thromboplastic protein of lung tissue. It is a protein compound linked with phospholipids and containing also some nucleic acid, but from the method used in its preparation one may feel uncertain whether this final product is a definite chemical compound.

For some years past I have been engaged in a similar effort to isolate active thromboplastin from lung tissue. I have been successful in obtaining from human lung a purified active product in a form which appears to be suitable for intravascular injection, but I am not sure at present that this product is free from contamination with inactive protein and lipoid constituents. In vitro this preparation causes hemophilic blood to clot in a few minutes or a few seconds, according to the concentration used, but what its action will be on hemophilic blood in vivo can be determined only by actual trial. Preliminary experiments on animals have given results of a somewhat unexpected character. It has long been known that crude tissue extracts injected intravenously into animals may cause sudden death from massive intravascular clots. On the other hand, under some conditions a negative phase is manifested and the coagulation time of the blood is prolonged. Using my purified product and injecting it slowly in dogs or cats, I have obtained usually this negative phase, and if the amount injected was increased gradually the blood finally became incoagulable. Examination of the blood at this stage showed that it contained no fibrinogen. The effect of the injections had been to defibrinate, or more properly to defibrinogenate, the animal's blood. Efforts to produce a positive phase, that is to shorten the normal time of coagulation, were not definitely successful. With very small doses one may obtain an indication of such an effect, but results of this kind are inconstant and not free from observational errors. On the other hand, an increasing delay in coagulation time is readily obtained, and in the light of the final result this effect may be explained as due to a diminution in the fibrinogen content of the blood.

These results would seem to me to indicate that in the normal animal thromboplastin in the circulating blood is not far from the concentration adequate to cause clotting. A small additional amount initiates, or perhaps simply accelerates, the conversion of fibrinogen to fibrin and thus lowers the amount of fibrinogen in the blood and prolongs coagulation time. In hemophilic blood, however, conditions are different in that there is a deficit in thromboplastin to start with. If our premise is correct, namely that this deficit constitutes the immediate cause of the delay in clotting, then intravenous injection of thromboplastin in proper amounts should restore normal coagulation time for a certain period. Patek and Taylor and Pohle and Taylor report results of this kind from intravenous or intramuscular injections of their "globulin substance" prepared from blood. One may expect, therefore, that when thromboplastin of the tissues is at last isolated successfully, in usable form, it will find a clinical application in the control of hemophilic bleeding.

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MANAGEMENT OF SCARLET FEVER CONTACTS

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In Illinois, cultures for hemolytic streptococci are not required by the quarantine regulations for scarlet fever. Patients are released from quarantine at the end of twenty-eight days unless they have draining purulent lesions, such as sinusitis, suppurating cervical adenitis or otitis media. They must remain away from schools and public gatherings for one week after quarantine is lifted. After the patient with scarlet fever is taken to a contagious disease hospital, nonimmune children in the same home are quarantined for seven days. Then, if no disease has developed, they are allowed to return to school. Adults and immune children are allowed to leave the quarantined home after a soap and water bath and a change to clean clothing, provided they make arrangements not to return. Nonimmune food handlers may resume their occupations but must be kept under daily observation. If the patient with scarlet fever remains in the home, his immediate attendant—usually the mother—and nonimmune children must remain on the premises until he is released from quarantine. (Thus the quarantine provision practically assures prolonged exposure of the susceptible brothers and sisters.)

EFFECTIVENESS OF PRESENT REGULATIONS

The following figures from our own experience indicate that the present regulations are not effective in protecting other persons in the patient's household from contracting scarlet fever. Other data could be presented showing that contacts in school are likewise not protected by these regulations, but the present report will be confined to family contact cases (table 1). Between Dec. 1, 1938 and Feb. 10, 1940, 893 persons with scarlet fever were admitted to the contagious disease department of the Cook County Hospital.

Of these 190 (21.3 per cent) had another member of the household, usually a brother or sister, in the same hospital with scarlet fever during the period of quarantine or soon after it (table 1). A survey of scarlet fever in the city of Evanston during the five year period 1935 to 1940 revealed that of 625 cases 26.6 per cent (166) were in families in which more than one member contracted scarlet fever. The combined figures for the Cook County Hospital and the city of Evanston showed that in only 26 of the 356 "multiple" cases (7.3 per cent) did the patient come down with scarlet fever on the same day as another member of the family.

Table 2 shows that the interval between the onset of illness in the contact and in the original patient varies greatly, the onset in only 63 per cent of all cases having occurred within seven days of the first exposure. The Illinois regulations regarding contacts are apparently based on the idea that the incubation period never goes beyond one week. While this may be true, among the patients in the Cook County Hospital series—all of whom were hospitalized—the contact frequently showed evidence of illness later than seven days after the original patient had been removed from the home. This means either that the incubation period was sometimes longer than seven days or that among the contacts there were healthy carriers who infected the susceptible persons.

Another important finding was that in 17 of the 81 families having "multiple" cases in the Cook County series and in 9 of the 70 in the Evanston series the first contact became ill after the twenty-eight day period of quarantine. That is, no scarlet fever occurred in the home after the first patient was hospitalized until he was released from quarantine and returned as a convalescent carrier of scarlatinal streptococci, to reexpose the other members of his family. In the contagious disease department of the Evanston Hospital, all patients with scarlet fever have cultures of material from the nose and throat made on blood agar before they are released from quarantine. The records of 100 consecutive patients were studied. Sixty-three were found to have had cultures showing hemolytic streptococci twenty-eight days after the onset of illness and in the absence of complicating lesions, such as draining ears or sinuses or suppurating glands. Hence 63 per cent, after complying with the state quarantine regulations, were still capable of spreading scarlet fever when released. The problem of scarlet fever in secondary cases developing from exposure to convalescent carriers became so urgent that the Evanston Hospital adopted the policy of retaining service patients in the hospital free of charge until they became free of hemolytic streptococci rather than allowing them to go home to infect others, who would soon be new patients to be cared for at the hospital.

TABLE 1.—*Incidence of Multiple Cases of Scarlet Fever in Families* *

	Cases of Scarlet Fever	Total "Multiple" Cases	Total Families Having Contact Cases	Average Number of Cases per Family
Cook County Hospital (14 months)	893	190	81	
City of Evanston (5 years)	625	146	70	
	1,518	336	151	2.34
Percentage of "multiple" cases, 22.1				

* "Multiple" cases are here regarded as those occurring in association with an attack in another member of the household or shortly thereafter.

It may be seen from the foregoing data that the present Illinois regulations,[1] in which cultures for hemolytic streptococci play no part and no steps are taken to protect susceptible contacts beyond isolation of the patient, are inadequate to prevent the spread of scarlet fever.

MODERN METHODS FOR THE CONTROL OF SCARLET FEVER

The Dicks [2] for several years have recommended the following procedures when scarlet fever breaks out in a home or an institution.

1. Isolate the patient.
2. Do Dick tests on all contacts, including adults.
3. Make cultures of material from the nose and throat of all contacts, using blood agar plates.
4. Take the temperature and inspect the throat and the upper part of the trunk of all contacts.

From the Department of Medicine, Northwestern University Medical School.

Read before the Section on Practice of Medicine at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Educational Health Circular 13 of the Illinois Department of Public Health.
2. Dick, George F., and Dick, Gladys H.: Scarlet Fever, Chicago, Year Book Publishers, Inc., 1938.

In cases in which the inspection and the temperature reading lead one to suspect the imminence of scarlet fever, passive immunization may be produced at once by the injection of a prophylactic dose (a minimum of 150,000 original neutralizing units) of scarlet fever antitoxin or an adequate dose of scarlet fever convalescent serum. It is safest never to give less than 40 cc. of convalescent serum for this purpose, although smaller doses are sometimes effective.[3] It is rarely necessary to use either agent. If no evidence of beginning illness in the contacts is found, it is safe to wait twenty-four hours, at the end of which time the results of the culture and the cutaneous tests are known. Reading of the temperature and inspection of the skin and the mucous membrane are again made, and persons found susceptible or showing signs of beginning illness are treated in the manner outlined. However, one week later their active immunization with 5 graduated doses of scarlet fever toxin (or more injections in less rapidly increasing doses [4]) is begun, so that they will be immunized by the time the quarantine is lifted. Among those found not to be ill, the following situations may be present:

TABLE 2.—*Number of Days Which Elapsed Between Onset in the First Case and Onset in the Contact Case*

(Combined Data of Cook County Hospital and Evanston Health Department)

Days After Onset	No. of Cases	Days After Onset	No. of Cases
Same day	26	25	1
1	21	27	2
2	24	28	2
3	16	29	3
4	12	30	4
5	13	31	2
6	11	32	1
7	7	33	2
8	4	34	4
9	2	35	5
10	1	36	2
11	1	38	1
12	3	39	2
13	0	40	1
14	2	41	1
15	4	43	1
16	3	47	1
17	1	48	2
18	4	56	1
19	1	57	1
20	5	60	1
21	2	83	1
24	1		
Total			205

Seven or less, total contact cases	130	(63%)
Seven to twenty-eight, total contact cases	39	(19%)
More than twenty-eight, total contact cases	36	(17%)

1. A contact may be found susceptible and harboring hemolytic streptococci. If he can be kept under daily observation, he may start active immunization at once, so that he will be immunized completely or partially by the time quarantine is lifted and contact with the convalescent patient, who is usually still a carrier of scarlatinal streptococci, is resumed. He must also be isolated from susceptible persons, because he is a carrier and hence capable of spreading scarlet fever. If he cannot be observed daily it is safer to give him passive immunization at once but to begin active immunization one week later.

2. A contact may be found susceptible but not infected. He should start active immunization at once, so that he will be protected when the convalescent carrier returns, but need not be quarantined, as he himself will not spread the disease.

3. A contact may have a culture positive for hemolytic streptococci but a negative Dick reaction. He needs neither passive nor active immunization but should be kept isolated from susceptible persons because the streptococci which he harbors must be regarded as scarlatinal streptococci until proved otherwise.

4. A contact may have a negative culture and a negative cutaneous reaction. He needs no treatment but should be kept from carriers so that he will not himself become a carrier.

An example of the procedures outlined is the following situation in the practice of one of us.

A school girl aged 6 years came down with scarlet fever. Her mother, an 8 year old sister and a 3 year old sister were examined. No sign of beginning illness was found in the contacts. All were given a Dick test and had cultures of material from the throat and nose made on blood agar plates.

Next day the mother, who was pregnant, was found to have a positive cutaneous reaction, indicating susceptibility to scarlet fever, and a culture positive for hemolytic streptococci. In order to avoid a possible serum reaction she was given 40 cc. of human convalescent scarlet fever serum instead of commercial antitoxin. This was repeated two weeks later, because the patient with scarlet fever was kept at home and the mother was her attendant. Active immunization was not undertaken at this time because of the pregnancy.

The 8 year old child was found susceptible, but her culture was negative for hemolytic streptococci. With the permission of the Evanston health department, she was removed to her grandmother's home and allowed to continue in school. Active immunization was started at once, and she had completed her 5 doses before she was allowed to return to her home.

The 3 year old child was found both susceptible and infected with hemolytic streptococci. She was given a prophylactic dose of scarlet fever antitoxin rather than convalescent serum because it was cheaper and more effective in our own experience and because the possible effects of serum sickness were not so serious in her case as in that of the mother. The mother was instructed in technics of avoiding infection, and, although this child remained in the home, active immunization was begun one week later. She had had 4 doses before the official period of quarantine was over, but she was kept from direct contact with the patient until completion of her immunizing series.

The father had been out of town when the patient contracted scarlet fever. He did not return to the home, but a culture and a cutaneous test were made. Both gave negative results. Hence he did not need immunization or isolation.

TABLE 3.—*Data on Patients Cared for at the Evanston Hospital (1935 to 1940) on Whom the Dick Methods for Handling Contacts Were Used*

Total number of patients	117
Average number of contacts in each home	4.3
Estimated total number of contacts	503
Known number of contact cases of scarlet fever	0

TABLE 4.—*Results of Cultures Made for Persons Directly Exposed to Scarlet Fever*

	Cultures for Hemolytic Streptococci				
	Positive		Negative		
	Number	Percentage	Number	Percentage	Total
Adults	32	32	68	68	100
Children (under 18 years)	235	58.1	169	41.9	404
	267	53	237	47	504

3. Rhoads, Paul S., and Gasul, B. J.: Convalescent Scarlet Fever Serum and Commercial Antitoxin, J. A. M. A. **102**: 2005 (June 16) 1934.

4. Rappaport, Benjamin: Active Immunization to Scarlet Fever with Less Reaction, J. A. M. A. **106**: 1076-1078 (March 28) 1936.

THE EFFECTIVENESS OF MODERN METHODS OF CONTROL

Numerous reports by the Dicks and others have given evidence of the effectiveness of the procedures outlined in checking the spread of scarlet fever.[2] Our own experience adds to this evidence. Two of us (P. S. R. and B. R.) have for years attempted to carry them out in the homes of our private patients with scarlet fever. The figures on 117 patients cared for by us in Evanston since 1935, including both private and service patients, are shown in tables 3, 4 and 5. Prior to the autumn of 1938, it was not possible to make cultures and perform Dick tests for all the home contacts of the service patients because not all the families would cooperate; hence the discrepancy between the number of contacts and the number of tests performed.

TABLE 5.—*Results of Dick Tests on Persons Directly Exposed to Scarlet Fever*

	Positive		Negative		
	Number	Percentage	Number	Percentage	Total
Adults	26	38.8	41	61.2	67
Children (under 18 years)	149	73.8	53	26.2	202
	175	65.1	94	34.9	269

TABLE 6.—*Summary of Typical Sequence of Cases of Scarlet Fever in Two Families of the Cook County Hospital Series*

Name	Age	Onset	Admission	Discharge
First family:				
Frank	6	9/14/39	9/18/39	10/13/39
George	10	10/17/39	10/19/39	11/14/39
Geraldine	8	10/18/39	10/19/39	11/18/39
Lee	4	11/ 1/39	11/ 2/39	11/29/39
Paul	8 mo.	11/ 9/39	Cared for at home	
Second family:				
Lillian	9	12/ 9/39	12/11/39	1/ 6/40
Clifton	10	1/ 9/40	1/13/40	2/ 6/40
Mildred	13	1/14/40	1/15/40	2/11/40

However, it was possible at times to get the private physician who sent in the patient to take these precautions, and in every instance careful instructions as to the protection of other children in the homes were given. In spite of the incompleteness of the work, no known contact cases occurred; at least there were none in our private practice, and no contacts were brought to the hospital from the homes of service patients. In the fall of 1938 the commissioner of health of Evanston (W. H. T.) began doing cutaneous tests and making cultures for the contacts of all service patients, and the Preventive Medicine Clinic of the Evanston Hospital, under the direction of Dr. Joseph Rappaport, undertook the active immunization of contacts. The incidence of scarlet fever dropped from 188 cases in 1938 to 65 cases in 1939. This active immunization of contacts may have been in part responsible.

COMMENT

The data presented reveal that the large majority of children who have not been actively immunized against scarlet fever by repeated doses of the sterile toxin or by having the disease are susceptible. A fairly large proportion of adults are susceptible (table 5). More than half of the persons studied who had been in direct contact with patients with scarlet fever harbored hemolytic streptococci, most of which were undoubtedly of scarlatinal strains (table 4). Sixty-three per cent of patients with scarlet fever were found to be carriers of hemolytic streptococci at the end of their quarantine of twenty-eight days. That these convalescent carriers often are the source from which scarlet fever spreads is shown by the data given and by such records of family contact as are listed in table 6.

SUMMARY AND CONCLUSIONS

In a series of 1,518 consecutive cases of scarlet fever studied at the Cook County Hospital, Chicago and in the city of Evanston, 23.3 per cent were "family contact" cases. It is obvious that the present quarantine regulations in Illinois (in which cultures on blood agar plates are not provided for) are ineffective in preventing the spread of scarlet fever, particularly to contacts in the home.

In a series of 117 consecutive cases in which we used the methods advocated by the Dicks for the prevention of the spread of the disease, there were no contact cases. These methods include cutaneous tests for susceptibility and the making of cultures on blood agar plates for all contacts, the passive immunization of persons about to come down with the disease and later the active immunization of these and all other susceptible contacts.

ABSTRACT OF DISCUSSION

DR. A. T. MCCORMACK, Louisville, Ky.: This is a perfect demonstration of the practice of preventive medicine by the family physician; until it is universally adopted by the family physician it will be necessary still for health departments to interfere unnecessarily with cases of infectious diseases, such as scarlet fever. In Kentucky we have adopted this procedure as a public health measure. A patient with scarlet fever is not released until there are two negative cultures. By this method the period of quarantine for scarlet fever is reduced because many patients become free from the hemolytic streptococci in less than twenty-eight days. Cases of scarlet fever have not developed during an epidemic in contacts under the observation of the state health department—now over 100,000—in which the third dose of the toxin has been administered. The contacts are not immunized by the third dose, but they are sufficiently immunized for the control of that particular exposure. Our Kentucky plan is unique. We go into institutions or into schools at the request of the authorities. We do not go into a county unless the county medical society invites us. At a meeting of the county society we demonstrate the technic to those physicians who are willing to learn it. In the cases that have been controlled under our own observation we have not had practically any serious reactions. In colleges and schools we have never had a student miss class. The family physician ought to do vaccinations. The family physician ought to do immunization against diphtheria, against scarlet fever and against every other disease for which immunization procedures have been developed. Every health department in the United States hopes and prays that physicians in other branches of the profession will accept that responsibility. One other point frequently made is that there are few deaths from scarlet fever. Our statistics show that the disorders and the complications following scarlet fever are more severe, expensive and troublesome than the deaths that occur from the disease. The majority of sequelae occurring in the milder cases are those in which there is no eruption, in which there are merely the scarlet fever and sore throat and in which the only means of definite diagnosis is in the laboratory. We have some 600 cases that we have followed for fourteen years since their original immunization; 80 per cent are still immune. Two injections at intervals of two, three, four or five years restore the immunity in the majority. The number who have deficient immunity mechanism and are not capable of immunization for a sufficiently continued length of time to make them immune for life is extremely small. In every county in Kentucky in which this procedure has been carried out we realize that we accepted a distinct responsibility, because the more immune individuals there are in the county

the less danger there is of an epidemic; but there is more danger to the nonimmunized individuals because there are more immune carriers.

DR. JESSE G. M. BULLOWA, New York: Dr. Rhoads advocates that there be active immunization, passive immunization and a longer quarantine with reliance on cultures for streptococci for the termination of quarantine. The authors' demonstration of the large diminution in the number of scarlet fever patients in Evanston would be more convincing if it was shown that there was no increase in the number of streptococcic sore throats without rash. I don't know whether that information is available. With active immunization I am in accord. At Willard Parker Hospital between 1933 and 1937 we had one thousand and fifty-seven student nurses from various hospitals. Thirty-one, or 2.9 per cent, came down with scarlet fever during their training. Dr. Irving Klein, the deputy medical superintendent, then undertook re-Dick testing at Willard Parker Hospital to determine whether the nurses were immune before duty in the scarlet fever wards. From 1937 to 1940 we had eighteen hundred student nurses, and no nurse who had a negative Dick test came down with scarlet fever. I do not favor lengthening the period of isolation or reliance on cultures. In New York City we quarantine scarlet fever for only twenty-one days. Before 1917 we had a quarantine period of thirty-five days. It was then reduced to thirty days, and finally in 1934, it was reduced to twenty-one days, because, using the borough of Brooklyn as a control against the other boroughs, it was found that there were few more return cases with the twenty-one day quarantine than there were with the thirty day quarantine. A few additional cases developed, 3 per thousand. Had we quarantined for thirty days instead of twenty-one days, there would have been an extra quarantine period of nine thousand days per thousand patients with all its expense and unnecessary hardship, especially for adults. Last year at Willard Parker Hospital we had 2,473 patients with scarlet fever. In the first twenty-eight days after discharge we had 46 return cases, or 1.9 per cent. Strict clinical criteria are employed. We do not use cultures for discharge because they may give a false sense of security. That is the chief objection. Duration of illness is not a criterion for retaining or discharging patients. In 1936 we had a patient who had been in the hospital with a discharge from the ear after a very stormy course, and on the one hundred and tenth day cultures of material from that patient were taken. Streptococcus hemolyticus was found and disregarded and there was a return case. Last year we had a similar case.

DR. PAUL S. RHOADS, Evanston, Ill.: I believe Dr. Bullowa has misinterpreted my recommendations about the termination of quarantine. I don't advocate that patients with positive cultures be held indefinitely. I think that would fill our fever hospitals unduly at the present time. My point is that persons with whom the discharged patient will come in contact when he leaves the hospital should be immunized so that they will not get scarlet fever when the carrier returns home; not that the patient be held indefinitely in the hospital until his cultures become negative. Also I should like to say that I think we should never depend on one culture for our final result in determining whether or not scarlet fever streptococci are present in the throat and nose. I think we should have a series of at least three negative cultures before we say that a patient is no longer a carrier of hemolytic streptococci. That might account for two cases Dr. Bullowa mentioned, in which no hemolytic streptococci were found at the time the patients were discharged, and yet the patients seemed to take scarlet fever home to their families. He raised the question Does the incidence of so-called nonspecific hemolytic streptococcus tonsillitis go up when the incidence of scarlet fever is decreased by immunization? That brings up the old question of whether scarlet fever immunization immunizes only against the toxemia, the erythrogenic toxin, or whether it immunizes against invasion by the hemolytic streptococci themselves. I shall not go into that question here because there is not enough time; also I don't know all the answers. I am talking here about scarlet fever. In our experience we can't answer the question of whether the incidence of streptococcic tonsillitis changes after immunizing nurses, for instance, in the contagious hospital, because cultures for hemolytic streptococci from sore throats were not taken prior to the time immunization of nurses against scarlet fever was begun at Cook County Hospital. After that time all of them were immunized, so we don't have any certain basis for comparison. No completely immunized nurses contracted scarlet fever. Place, who made such a study in Boston City Hospital, found that after immunization of the nurses in the contagious hospital the incidence of scarlet fever was cut down to practically nil. Also the incidence of nonspecific tonsillitis was cut down.

TREATMENT OF EXPERIMENTAL TUBERCULOSIS

USE OF SODIUM P,P'-DIAMINODIPHENYLSULFONE-N,N'-DIDEXTROSE SULFONATE ("PROMIN") WITH NOTES ON SOME TOXIC EFFECTS OBSERVED IN MAN

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Evidence has been obtained [1] that sulfanilamide may modify the course of experimental tuberculosis in guinea pigs. Similar results were reported for sulfapyridine [2] and for azosulfamide.[3] These results now have been confirmed by a sufficient number of laboratories to require their acceptance. The effect of these drugs appeared to be one of retardation of the rate of development of the disease in treated animals when they were compared with untreated controls. In addition a definite alteration in the histologic features of the lesions was described.[4]

Our first experiment with sodium p,p'-diaminodiphenylsulfone-N,N'-didextrose sulfonate [5] established the fact that this drug could inhibit, partially or totally, the development of experimental tuberculosis in guinea pigs. In this experiment treatment was started two days before inoculation with human tubercle bacilli. The conditions of this earlier experiment did not simulate natural infection, since the infecting organism had been introduced into animals already receiving the chemotherapeutic agent. A second experiment then was devised to determine whether established tuberculosis of guinea pigs could be arrested or eliminated by this compound. At the same time the first experiment was repeated for confirmation.[6]

Eighty guinea pigs were inoculated with a lethal dose of human tubercle bacilli (0.0005 mg. of strain H37RV). These animals were divided into eight groups. Group 1 consisted of 12 untreated control animals. Group 2 consisted of 8 animals that received sodium p,p'-diam-

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This drug was kindly supplied to us by Dr. E. A. Sharp of Parke, Davis & Co., Detroit.

From the Division of Medicine, Mayo Clinic (Dr. Hinshaw), and the Division of Experimental Medicine, Mayo Foundation (Dr. Feldman).

Read before the Section on Pharmacology and Therapeutics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Rich, A. R., and Follis, R. H., Jr.: The Inhibitory Effect of Sulfanilamide on the Development of Experimental Tuberculosis in the Guinea Pig, Bull. Johns Hopkins Hosp. **62**: 77-84, 1938.

2. Feldman, W. H., and Hinshaw, H. C.: Effect of Sulfapyridine on Experimental Tuberculosis in the Guinea Pig, Proc. Staff Meet., Mayo Clin. **14**: 174-176 (March 15) 1939.

3. Birkhaug, Konrad: Treatment of Experimental Tuberculosis with Sulfonamide, Brit. M. J. **2**: 54-57 (July 8) 1939.

4. Feldman, W. H., and Hinshaw, H. C.: Sulfapyridine in Experimental Tuberculosis: The Pathology of Experimental Tuberculosis and of Apparent Toxic Changes in Guinea Pigs Treated with Sulfapyridine, Am. Rev. Tuberc. **41**: 732-750 (June) 1940.

5. Feldman, W. H.; Hinshaw, H. C., and Moses, H. E.: The Effect of Promin (Sodium Salt of p,p'-Diamino-Diphenyl-Sulfone-N,N'-Dextrose Sulfonate) on Experimental Tuberculosis: A Preliminary Report, Proc. Staff Meet., Mayo Clin. **15**: 695-699 (Oct. 30) 1940.

6. Feldman, W. H.; Hinshaw, H. C., and Moses, H. E.: The Treatment of Experimental Tuberculosis with Promin (Sodium Salt of p,p'-Diamino-Diphenyl-Sulfone-N,N'-Dextrose Sulfonate): A Preliminary Report, Proc. Staff Meet., Mayo Clin. **16**: 187-190 (March 19) 1941.

inodiphenylsulfone-N,N′-didextrose sulfonate continuously from the day of inoculation. Group 8 consisted of 20 animals whose treatment was started two days before inoculation with tubercle bacilli. The remaining groups (3, 4, 5, 6 and 7) each contained 8 animals and treatment was delayed after inoculation for three days, one week, two weeks, four weeks and six weeks respectively. In all groups the drug was mixed with the food in a concentration of 1 per cent. The amount of drug consumed by each guinea pig daily was estimated to be about 300 to 400 mg. Group 8 constituted a repetition of our previously reported experiment.[5] Groups 6 and 7 were treated so late after inoculation that we expected them to yield results similar to those of the control group and we were surprised when this did not occur.

In all the control animals (except 1 which died eight days after inoculation) widespread visceral tuberculosis developed. The disease was sufficiently severe to account for the death of all controls. The last animal of the control group died one hundred and eighty-nine days after inoculation. At this time 57 (84 per cent) of the treated animals were living and apparently well. Of the 11 that had died prior to this time none had grossly detectable visceral tuberculosis. The experiment was then terminated by killing all remaining animals one hundred and ninety-two days after the date of inoculation.

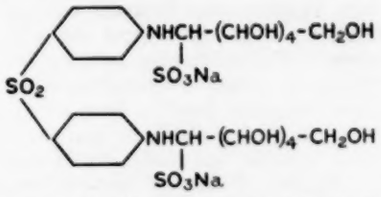
At necropsy it was not possible to detect any gross lesions of tuberculosis in 41 (60 per cent) of the 68 treated animals. In 24 of the remaining 27 animals the grossly visible lesions were limited to tiny nodules in the subcutaneous tissue at the site of inoculation, to involved regional lymph nodes or to both. Only 3 treated animals (4 per cent) had sufficient residual tuberculosis to be detected grossly in the viscera, and in no instance did the disease appear to be sufficiently extensive to have caused death of the animal. We noted no significant differences between animals that had received treatment before infection and those whose treatment was delayed for as long as six weeks.

Convincing evidence was obtained that the treated animals had been successfully inoculated with tuberculosis. Previous extensive experience with this strain has shown its virulence. All control animals died of tuberculosis, and microscopic examination of treated animals demonstrated evidence of preexisting or inactive tuberculosis in 40 (59 per cent) of the 68 treated animals. The lesions observed were of types rarely seen in guinea pigs. Caseation necrosis was absent. Fibrosis was frequently observed, sometimes with encapsulation of the lesions. Partial or complete calcification was occasionally noted, which was surprising in view of the relatively short duration of the disease (approximately six months). Tissues contiguous to lesions showed no reaction to suggest active or progressive disease. Tuberculosis was not detected in many of the treated animals. In the remainder it was restricted greatly in distribution, was reduced in quantity in all instances and was altered in character to a striking degree. This was regarded as evidence that chemotherapy had been successful in restraining the disease and in producing retrogressive changes in the lesions.

Sodium p,p′-diaminodiphenylsulfone-N,N′-didextrose sulfonate now has been employed by us and our associates [7] in treatment of more than 75 patients who had various infections, including primary pneumonia, postoperative atelectasis and pneumonia, pulmonary tuberculosis, meningeal tuberculosis, renal tuberculosis and cutaneous tuberculosis. The drug has been administered orally, subcutaneously, intramuscularly and intravenously. The intravenous and subcutaneous treatments have been given both by intermittent injections and by continuous drip. Orally the dosage has ranged from 1.2 to 3.2 Gm. a day. As much as 16.0 Gm. daily has been administered parenterally.

This compound is highly soluble and usually has been employed in 40 per cent aqueous solution for parenteral administration. Subcutaneous injections are moderately to severely painful. Intramuscular injections are tolerated better, and intravenous injections produce no unfavorable reaction if given slowly.

The only serious toxic effect noted among patients receiving the drug has been the development of hemolytic anemia, and this has occurred in serious degree only after oral administration. In 1 case severe hemolytic anemia developed on the third day of treatment while the patient was receiving 1.6 Gm. a day orally. This condition resembled the acute anemia which rarely occurs after treatment with sulfonamide drugs and may have represented a drug idiosyncrasy. However, sodium p,p′-diaminodiphenylsulfone-N,N′-didextrose sulfonate displayed a uniform tendency to produce anemia if given orally in large doses over a prolonged period. Doses of 1.6 to 3.2 Gm. daily by mouth were tolerated for



Chemical structure of sodium p,p′-diaminodiphenylsulfone-N,N′-didextrose sulfonate.

eight to ten days, after which the hemoglobin content of the blood tended to fall slowly or rapidly. The evidence indicated that this was a hemolytic effect. Evidence of marked erythrocyte regeneration was noted. When administration of the drug was discontinued, the hemoglobin content of the blood rose within a few days.[8]

Severe anemia has not occurred among patients receiving the drug parenterally. In 1 case in which 12.0 Gm. daily was given intramuscularly slight anemia developed after two or three weeks of treatment, but this was not progressive and did not necessitate interruption of treatment.

Cyanosis, usually of striking intensity, was noted uniformly among patients receiving this drug orally but was rarely seen among those receiving it parenterally. Subjective complaints of headache, lassitude or restlessness were frequent after oral administration but were largely absent when the drug was given parenterally.

Blood concentrations of the drug were maintained at a more uniform level and with much smaller doses when the drug was given orally. The drug enters the cerebrospinal fluid, but its concentration there has been considerably below that of peripheral blood drawn at the same time. We have had the opportunity of making observations on the cerebrospinal fluid only six times on 3 patients, and there was considerable variation in results.

7. Dr. Karl Pfuetze will collaborate in a subsequent clinical report.

8. Our colleague Dr. B. E. Hall has studied the blood of these patients, and his observations will constitute a separate report.

We have preferred the oral route of administration because our results in guinea pigs were obtained by this method. Furthermore, patients prefer to take the drug orally because the relatively mild symptoms noted are less uncomfortable than the distress produced by parenteral injections. It seems probable that the drug undergoes chemical transformation when given by the oral route.

The clinical evaluation of any therapeutic agent in human tuberculosis must be undertaken with the greatest caution. The marked tendency of many forms of the disease is toward steady improvement without treatment. The anticipated clinical course of tuberculosis may be so variable that control evidence is difficult to establish. Therefore we would caution urgently against insecure conclusions in the study of chemotherapy in clinical tuberculosis, recalling the history of tragic disappointments which followed the early use of tuberculin and other forms of treatment. Equal care must be taken lest some treatment be discarded prematurely, especially when there are wide choices of means of administration and dosage. We believe that the drawing of either positive or negative conclusions should be avoided until the force of facts makes these conclusions self evident.

ABSTRACT OF DISCUSSION

DR. J. ARTHUR MYERS, Minneapolis: I had the pleasure of visiting Drs. Hinshaw and Feldman and saw their setup for experimental work and their gross and microscopic postmortem specimens. The difference between the control and the treated animals is almost unbelievable. Finally, after fifty centuries of trial man has found a drug which apparently is capable of controlling tuberculosis in animals. It will be of interest to know what further studies reveal with reference to the presence or absence of tubercle bacilli in the small atypical lesions of the treated animals, whether these animals will live out the natural span of life without developing significant disease, and whether allergy remains or disappears. The medical profession has been misled many times concerning drug therapy because of statements made on insufficient evidence. Drs. Hinshaw and Feldman are ultraconservative in their statements, and this is laudable. They have pointed out that a great deal of work is necessary to determine the effect of the drugs they are studying on tuberculosis in man. However, it appears that with this or some closely related drug we may be approaching the time when tuberculosis in man can be quickly controlled. The time may come when the person who is found to react to tuberculin but has no other evidence of tuberculosis will be treated by chemotherapy, just as the patient who has a positive Wassermann reaction with no other evidence of syphilis is treated by chemotherapy. I should like to suggest that the physicians of this country allow Drs. Hinshaw and Feldman to proceed unmolested. They have a perfect setup for their experimental studies. They have an abundance of clinical material with which they are cautiously determining the efficacy of chemotherapy on tuberculosis in human beings. They have every necessary qualification for the completion of this work. When they have finished their studies with reference to toxicity, safe dosage and efficacy of the drug they will present their findings to the world.

Cold Exhaustion.—As a result of fatigue an individual wandering in the cold surrenders to an overpowering desire to sleep. During this unconscious state, temperature regulation is disturbed and much heat is lost. The body temperature falls; at 68 F. coma sets in and death results. It has been pointed out that a fall of temperature depresses the dissociation of oxyhemoglobin and tends to lower oxidation in the tissues.—Wright, Samson: Applied Physiology, New York, Oxford University Press, 1940.

OBSERVATIONS ON THE IMPLANTATION OF TESTOSTERONE PELLETS

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Within the past few years the literature on testosterone has become voluminous. In large part it deals with laboratory experiments, animal studies and the like. Carefully controlled clinical observations over long periods of time have been comparatively few. Still, the ultimate goal is the actual clinical application, for without such its importance is reduced and its value largely academic. In our clinic we have treated a large number of patients suffering with a wide diversity of conditions, including the postcastration status, eunuchoidism, hypogonadism of other types such as Lorain-Levi infantilism and hypopituitarism, impotence and others. For clarity and brevity only selected cases will be reported at this time, others being left for later communications.

This report deals with observations on patients chosen from the "hypogenital groups," numbering in all 60, of whom 30 have been given further treatment by implantation, 30 having been treated by injections only. The 30 patients given implantations have received a total of seventy implants.

IMPLANTATION OF TESTOSTERONE PELLETS AS A METHOD OF LONG-CONTINUED TESTOSTERONE THERAPY

Our observations and experiences led us early to realize that the injection therapy would have to be administered frequently, regularly and for long periods. The numerous objections to this soon became apparent to both physician and patient. The work of Brock and Druckrey,[1] Deanesly and Parkes[2] and Noble[3] on animals suggested the subcutaneous implantation of hormone pellets in human beings, and Bishop's[4] report on the implantation of a tablet of estrone in a woman with relief of menopausal symptoms immediately prompted us to apply this form of therapy in males, using testosterone pellets.

Deanesly and Parkes[5] clearly demonstrated the "effectiveness of crystalline gonadal hormones when administered by the subcutaneous implantation of solid tablets of the pure substance" in mice, rats, guinea pigs and rabbits. We readily substantiated this in guinea pigs and rabbits. More recently Vest, Drew and Langworthy[6] have reported similar and more pertinent detailed observations on the monkey. Reviewing Deanesly and Parkes's original reports, they noted that testosterone was absorbed at the rate of approximately 25 per cent a month, giving a calculated average life to an implanted pellet of about four months, although it is possible, and highly probable, that the rate would

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The testosterone pellets were supplied by the Schering Corporation through Dr. Max Gilbert.

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Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of some illustrations. The complete article appears in the authors' reprints.

1. Brock, N., and Druckrey, H.: Klin. Wchnschr. **17**: 23 (Jan. 1) 1938.
2. Deanesly, R., and Parkes, A. S.: Proc. Roy. Soc., London **124**: 279 (Dec. 7) 1937.
3. Noble, R. L.: Lancet **2**: 192 (July 23) 1938.
4. Bishop, P. M. F.: Brit. M. J. **1**: 939 (April 30) 1938.
5. Deanesly, R., and Parkes, A. S.: Lancet **2**: 606 (Sept. 10) 1938.
6. Vest, S. A.; Drew, J. E., and Langworthy, O. R.: Endocrinology **27**: 455 (Sept.) 1940.

vary and that, as the pellet became smaller, the amount absorbed would be less per month and the life of the pellet prolonged, but perhaps with decreased efficacy. They also pointed out that "the rate of absorption from a tablet must depend largely on its surface area, and will therefore be absolutely greater, though proportionately less, from a large tablet than from a small one." Also, "the simplest way to increase the intensity of action would be to insert a number of tablets of a size calculated to last for the desired period." Finally, they concluded that "the technic is particularly useful where a long continued steady effect is required" and suggested that "treatment of very long duration following one administration of hormone will be possible by implantation of tablets."

Our original observations on the implantation of testosterone tablets have already been reported.[7] A preliminary report on the implantation of testosterone has also been made by Howard and Vest.[8] This has been carried on until today we have observed a total of 30 patients who have received implants, 7 patients receiving one implant, 14 patients two, 6 patients three and 3 patients their fourth implant, totaling sixty-five implants, plus two occasions on which the implants were ejected spontaneously and three occasions on which the pellets were removed after one, two and three months for weighing and examining them.

It was our original plan to administer treatment by injections of testosterone propionate (25 or 50 mg. three times a week) for a sufficiently long period of time to permit a "build-up" of testosterone effects and then, and then only, to resort to implantations, repeating them at intervals as indicated or required (three to six month intervals). This was carried out in most cases. In some cases no preliminary injections were given, and the desirability or undesirability of this will be further discussed. The first implants were single 200 mg. pellets; later we used two, three or four such pellets in each case, and still later we made observations with one, two, three or four 150 mg. tablets. Finally, bearing in mind Deanesly and Parkes' words that "the simplest way to increase the intensity of action would be to insert a number of tablets of a size calculated to last for the desired period," and that "as the pellet became smaller the amount absorbed would be less per month and the life of the pellet prolonged," we decided to use from six to eight 50 to 75 mg. tablets. Our original method, still employed with the larger pellets, was by the incision and "pocket formation" (to be described later), while our more recent multiple 50 mg. pellet implants were performed with a trocar (described later). Failure of therapeutic response, spontaneous discharge of the pellets and other observations will be described.

REPORT OF CASES

CASE 1.—A. W., a college student aged 20, entered the clinic on May 3, 1938. His family history was irrelevant. When he was 2 years old a right congenital inguinal hernia was repaired, and at 3 he had an uncomplicated attack of mumps. The testicles were never palpated. His growth was entirely normal, pubic hair appeared at 14 but at 16 he became conscious of inadequate sexual growth. A course of treatment with chorionic gonadotropin stimulated the growth of pubic hair, libido and occasional erections. On admission the patient was acutely conscious of genital underdevelopment, absence of facial hair, a high pitched voice and a lack of confidence which he attributed to sexual inadequacy. Physical examination revealed that the patient was of normal height, had feminine contours and had an extremely youthful appearance. The blood pressure was normal. Genital examination alone showed divergence from the normal. The penis was small, the scrotum was flat and no testicles could be felt. His height was 68½ inches (174 cm.), span 71½ inches (182 cm.), the upper measurement 31½ inches (80 cm.) and the lower 37 inches (94 cm.). The basal metabolic rate was minus 7 per cent. Roentgenograms of the skull and the blood chemistry were normal. The dextrose tolerance curve was 85, 105, 115. Treatment begun in May 1938 consisted of testosterone propionate 25 mg. three times a week, then twice a week by intramuscular injection. A total of 3,500 mg. was administered over a period of sixteen months. The results were dramatic and sustained. The genitals increased appreciably in size, the voice deepened, bodily strength increased and he took on a more muscular and masculine appearance. His weight increased many pounds, and his personal confidence matched his physical gains. After ten months of this therapy intercourse was attempted and was completely successful, with mutual satisfaction for the partners. In October 1939 two 200 mg. tablets were implanted successfully after the first attempt was followed by ejection of the tablets. The satisfactory status was maintained. The patient married and leads a normal sex life, though his wife has been informed of his undoubted sterility. The implant maintained its expected activity for nine months, after which "withdrawal symptoms" appeared. He was reimplanted in September 1940 with 400 mg., with renewal of the testosterone effects.

CASE 2.—F. V. A., a musician aged 29, entered our clinic in November 1939. A brother aged 33 presented, according to the patient, an identical problem, which was genital underdevelopment and inadequate secondary sex characteristics. A high pitched voice and feminine contours were also present. The patient was moderately tall, with a hairless, immature face, wide flared hips and small genitalia. The testicles were small and were located in a small scrotum. Measurements were: height 70¼ inches (178 cm.), span 75 inches (190 cm.), upper 30¾ inches (78 cm.) and lower 39½ inches (100 cm.). The basal metabolic rate was minus 16 per cent and the dextrose tolerance curve 80, 90, 75. Roentgenograms of the sella turcica showed it to be 15 per cent undersize, and there was a delay of about ten years in epiphysial development. Treatment from Nov. 11, 1939 to Jan. 4, 1940 consisted of 50 mg. of testosterone propionate three times a week. This was followed by a satisfactory increase in the size of the penis, pubic hair and deepening of the voice. On January 5, 600 mg. of testosterone was implanted, with further improvement. The effects began to run down about August and a new implantation (400 mg.) was done in September. He again reports excellent libido and erections and increased general well-being.

CASE 3.—S. L., a medical student aged 20, came to our clinic in December 1939. The past and family histories were irrelevant. His chief concern on admission was inadequate genital development with no change since the age of 15. There was no growth of hair on the face, and the pubic and axillary hair was sparse. The voice was high pitched. On examination, the only divergence from normal was a small penis, shallow scrotum and two small testes. The laboratory data were irrelevant. Treatment, started in December, consisted of 50 mg. of testosterone propionate injected three times a week. Up to Feb. 20, 1940 1,500 mg. was injected. The penis increased decidedly in size, the pubic hair spread, the voice deepened and erections were common. On February 23, 600 mg. of testosterone was implanted. In August after the growth of some facial hair, the effects began to subside, and in September 350 mg. was inserted by trocar (seven 50 mg. pellets). Within two weeks he again described the return of "full" response.

CASE 4.—B. Z., a student aged 17, was admitted to the clinic in November 1939. The family history was irrelevant. He had undergone an operation for bilateral inguinal hernias

7. Eidelsberg, Joseph, and Ornstein, E. A.: Endocrinology **26**: 46 (Jan.) 1940.
8. Howard, J. E., and Vest, S. A.: Am. J. M. Sc. **198**: 823 (Dec.) 1939.

at the age of 6 years. The testicles were undescended and only one was found in the canal at operation, but no correction was attempted. The immediate problem was undescended testes and genital underdevelopment. Physical examination showed him to be well developed and normal in all respects but genitally. There was a moderate amount of axillary and pubic hair, with

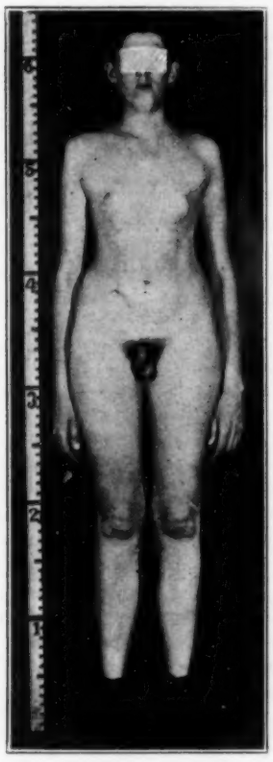

Fig. 26 (case 6).—Appearance in June 1939.

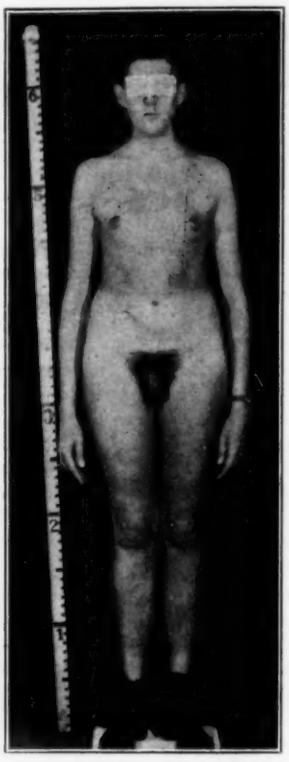

Fig. 27 (case 6).—Appearance in January 1940.

feminine distribution. The penis was 2 inches (5 cm.) long and 3 inches (7.6 cm.) in circumference. The testicles were not felt. The measurements were 67 inches (170 cm.) in height, span 67 inches, upper 30 inches (76 cm.) and lower 37 inches (94 cm.). The basal metabolic rate was normal and the dextrose tolerance curve was flat, with values of 75, 82, 65. Roentgenograms of the wrists showed slight delay in epiphysial union. Treatment begun in December 1939 consisted of 50 mg. of testosterone propionate three times a week. After one month there was a satisfactory increase in the size of the penis. In January 1940 a 200 mg. tablet of testosterone was implanted. After another month, hair appeared on the upper lip, the left testicle was palpated in the inguinal canal and the penis further increased in size. In April the penis was still growing slowly, erections were frequent, masturbation was followed by ejaculation and the tablet was still palpable. In September the effects were "running down" and testosterone (six 50 mg.) pellets were inserted by trocar. He has since maintained what appears to be a normal status.

CASE 5.—T. McH., aged 21, who entered our clinic in March 1940, had been receiving treatment elsewhere for sexual underdevelopment for the past two years with anterior pituitary extracts, a testicular preparation and 5 mg. doses of testosterone propionate, later increased to 25 mg. twice a week. The latter treatment had caused increased growth of the penis, pubic hair, height and weight. Treatment was continued intermittently but with little progress after the initial surge. The patient's height was 69 inches (175 cm.), span 71 inches (180 cm.), upper measurement 29½ inches (75 cm.) and lower 39½ inches (100 cm.). The physical examination was negative except for the genitals. The penis was below average in size, measuring 1½ inches (3.8 cm.) long and 3 inches (7.6 cm.) in circumference. The pubic hair was of female distribution and sparse. The scrotum was shallow and contained two small testicles. The significant laboratory data were a basal metabolic rate of minus 14 per cent, and bone age studies showed a two to three year delay in ossification. In April 1940 400 mg. of testosterone was implanted (two 200 mg. pellets). After two months, the voice deepened and the penis increased in size. Erections were active and a circumcision was performed in August. After five months there was a moderate recession in the size of the penis and number of erections. A second implant was done in September with six 50 mg. tablets, and he again reports general well-being, erections and satisfactory libido.

CASE 6.—F. P., aged 32, an accountant, was first seen by us in May 1939. His family and past histories were irrelevant. He was tall and well built, and his main wish was to have something done about the "size of his genitals," which were considered totally inadequate. He had little or no sex consciousness and had never shaved or masturbated. His testicles had always been small and in the scrotum. Breast tissue had developed in the past two years. The skin was smooth and clear, and there was no beard or axillary hair. The physical examination was of no significance, except for the genitals. The hips were wide, the pubic hair was slight in amount and the penis was small. The height was 73 inches (185 cm.), span 81 inches (206 cm.), the upper measurement 32 inches (81 cm.) and the lower 41 inches (104 cm.). The laboratory data revealed a basal metabolic rate of minus 15 per cent. Treatment started in July 1939 consisted of 25 mg. of testosterone propionate three times a week for two months. There followed considerable enlargement of the penis. The testicles and scrotum also increased in size. The voice deepened and more pubic hair appeared. On September 19, 200 mg. of testosterone was implanted, but by Jan. 5 1940 the tablet was not palpable and the effect had subsided. However, an extremely

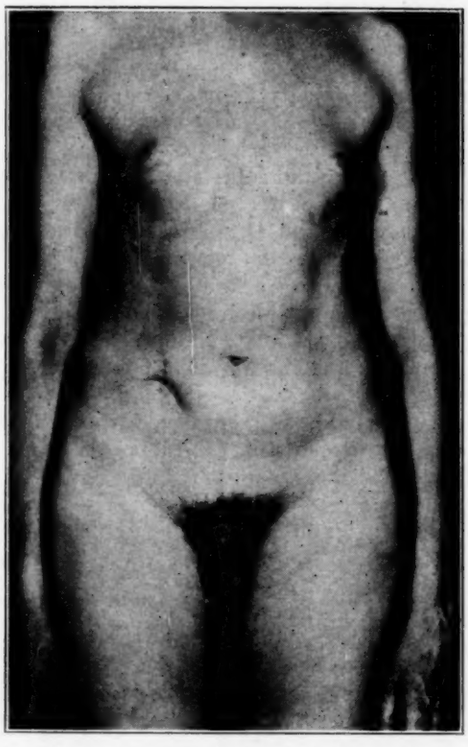

Fig. 28 (case 6).—Appearance in June 1939.

severe facial acne appeared which was treated locally. Circumcision was also performed. At this time, January 1940, 600 mg. was implanted—three 200 mg. tablets. The effect continued most satisfactorily until July and then began to decline. On October 2 350 mg. was implanted again with considerable and excellent effects.

CASE 7.—F. B., aged 27, who came under observation on Nov. 14, 1939, had the usual chief complaints of small genitalia, rare erections, absence of facial and axillary hair and sparse pubic hair. Physical examination was negative, aside from these abnormalities. His basal metabolic rate was minus 2 per cent. Blood pressure was normal. He weighed 144 pounds

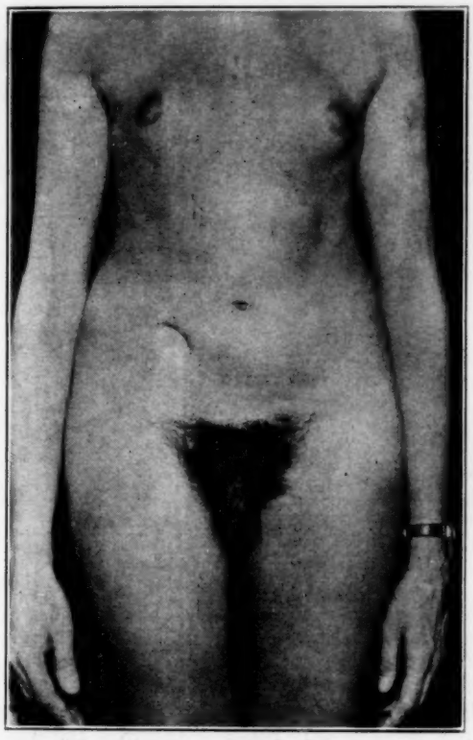

Fig. 29 (case 6).—Appearance in January 1940.

(65.3 Kg.). He received 700 mg. of testosterone propionate by injection from Nov. 16, 1939 to Jan. 1, 1940. The response was well defined. On January 2 two 200 mg. tablets of testosterone were implanted. The effect was maintained satisfactorily until July, when it began to decline, and by August he complained of a decrease in the size of the penis, absence of libido and a loss of 15 pounds (6.8 Kg.) (from 160 to 145 pounds [72.6 to 65.8 Kg.]). October 1, 300 mg. was again implanted, and the original satisfactory status returned in about two weeks.

RATE OF ABSORPTION OF IMPLANTED PELLETS

Deanesly and Parkes'[5] original animal studies suggested that approximately 24 or 25 per cent of the implanted pellet of testosterone was absorbed per month when pellets weighing 29 mg. and 100 mg. were used, the determinations of amounts absorbed made after forty-five and forty-one days. One must remember the size of their pellets and the animals used (guinea pigs). Vest, Drew and Langworthy,[6] in the monkey, demonstrated that 184.5 mg. was absorbed in ninety-two days from two pellets (166.5 mg. and 243 mg.) and 325 mg. absorbed in one hundred days from two pellets (225 mg. and 267 mg.). The calculated average amounts of substance absorbed per day were about 2 mg. and 3.25 mg., the extremes being 1.4 mg. and 4.7 mg. for single pellets.

On three occasions we removed implanted pellets from patients after one, two and three months.

EXPERIMENT 1.—Two pellets were inserted weighing 150 mg. each, a total of 300 mg. After one month they were removed and weighed, one pellet weighed 95 mg. and the second 115 mg., totaling 210 mg. This represented an absorption of 90 mg. in this, the first, month, or 30 per cent. The average amount of substance absorbed per day was therefore 3 mg.

EXPERIMENT 2.—Two pellets were inserted weighing 150 mg. each, a total of 300 mg. After two months they were removed and weighed, one pellet weighing 85 mg. and the second 55 mg., totaling 140 mg. This represented an absorption of 160 mg. in two months, or 53 per cent. The average amount of substance absorbed per day was therefore 2.66 mg.

EXPERIMENT 3.—Two pellets weighing 300 mg. on insertion were removed after three months and weighed a total of 95 mg. (35 mg. and 60 mg.). This represents a total absorption of 205 mg., or 68 per cent, or an average absorption of 2.28 mg. a day.

However, one must note the wide range of the weight of the removed pellets and the possibilities resulting from overlying or overlapping of pellets. Unquestionably the size of the pellet would make a further variation. However, the constancy of the daily average is striking. Also it appears that the first month's absorption was about 30 per cent, the first two months about 53 per cent (or 23 per cent in the second month) and 68 per cent absorbed in the first three months (or about 15 per cent in the third month). Thus with each passing month the rate of absorption decreased, probably as the total surface exposed decreased, as surrounding tissue reaction progressed and for other possible reasons.

Nevertheless, the clinical observations add up to one fact, namely that most patients were definitely benefited by implantation, just as they were by injections, and that as time progressed the effects gradually subsided. However, reimplantation could be performed readily, and with it there were renewed effects of testosterone therapy. As demonstrated, some patients returned for reimplants in four months, others in six months, while still others were not given reimplantations for eight or ten months. This was to be expected as the so-called regression or withdrawal symptoms appear at variable times, or even fail to appear in occasional cases.

ENCAPSULATION OF IMPLANTED PELLETS

In several animals (rabbits), pellets of testosterone (50 and 150 mg.) were inserted and removed at varying intervals. At no time were surrounding reactions sufficient to warrant a description of capsule formation. However, several clinical observations are worthy of special note.

CASE 8.—B. C., aged 32, came under observation on Nov. 20, 1939. His family history was irrelevant. He had a congenital dislocation of the left hip and had had a number of operations thereon. He had always been conscious of a lack or failure of genital development and of inadequate sex characteristics, especially so since the age of 17. There had never been any facial or axillary hair, but there had been a slight growth of suprapubic hair. His voice was feeble and high pitched. Erections occurred on rare occasions. Physical examination revealed that he was tall and thin, with long extremities, distinct genital underdevelopment, no facial or axillary hair and a slightly female escutcheon. There was a wide scar of the operations performed on his left hip. His physical examination was otherwise negative. The blood pressure was 130 systolic and 75 diastolic; his weight was 136 pounds 61.7 Kg.) and his height 70¼ inches (178 cm.). The basal metabolic rate was minus 13 per cent. The dextrose tolerance curve was 65, 85, 67. Roentgenograms revealed a rather small, shallow sella turcica. The testes were very small, the scrotum was thin and small and the penis small and shrunken. From December 1 to December 26 he received a total of 500 mg. of testosterone propionate by injection. Erections appeared frequently, onanism

with orgasm was reported, his voice became husky and the genitals showed unmistakable evidence of improvement and growth. On December 26 one 200 mg. tablet was inserted. On Feb. 2, 1940 he reported that there was no further progression but rather a stationary status for the past several weeks. The pellet was definitely palpable, and, in comparison to other cases six to eight weeks following implantation, it seemed to be large. On March 26 the tablet was still very large, the erections had ceased and the genitals had receded somewhat in size. On March 29 600 mg. of testosterone was implanted (three 200 mg. pellets). April 12 the penis again was larger, erections were frequent and he weighed 148 pounds (67.1 Kg.), but by May 3 the maximum effect had passed and the newly implanted pellets were still distinctly palpable, as was the pellet implanted in December. On June 7 the pellet inserted on Dec. 26, 1939 was removed (five and one-half months after implantation). There appeared to be a definite dense capsule surrounding the hard center (the pellet). The laboratory reported that the specimen was an irregular, oval mass of fat and fibrous tissue 17 by 10 by 8 mm. On section, a band of gray fibrous tissue 2 mm. thick surrounded a yellow calcific mass about 5 mm. in diameter. Microscopically the specimen revealed a thick capsule of connective tissue which was moderately dense and contained a number of giant cells of foreign body type. No foreign bodies were seen in them, however. The diagnosis was foreign body granuloma (Dr. M. M. Richter). During July and August all testosterone effects were practically absent. In September injections were resumed, 25 mg. three times a week, with renewal of testosterone effects—growth of genitalia, erections, change in voice and others.

Thus in an occasional case a definite reaction occurs about the implanted pellet. This seems characteristic of the individual patient and may reappear with subsequent implantations. On the other hand, we have repeatedly reimplanted into sites of the original implantations at intervals of three, six and ten months, without finding any evidences of the originally implanted pellets, or evidences suggesting capsule or scar tissue formation. There were no evidences of interference with the absorption of the pellets inserted at the second or third implantation.

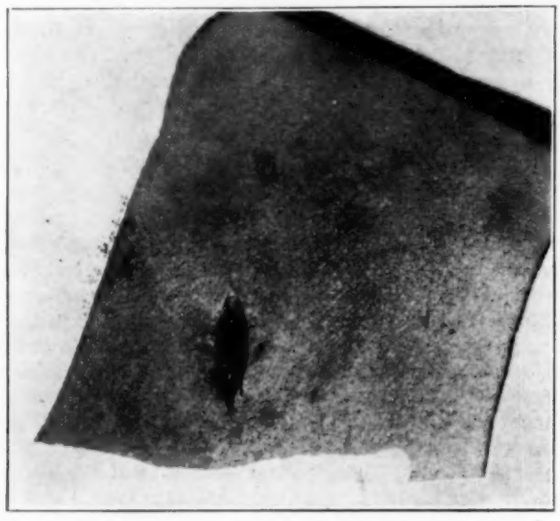

Fig. 46.—Step 2 in implantation technic.

Another experience is worthy of note and further emphasizes this observation:

CASE 9.—E. J. S., a man aged 52, single, was first seen by us Dec. 2, 1939. The only important facts in his previous history were as follows: He was well and normal in every way until at the age of 20 he had an episode of hemoptysis and was told he had pulmonary tuberculosis. He spent one year in a sanatorium and was discharged as "cured." His life from 21 to 40 years of age was that of any normal adult. He had begun to shave regularly at 16. He was normal sexually and had no complaints. At 40 a right orchiectomy was done because of tuberculosis; about two years later a left

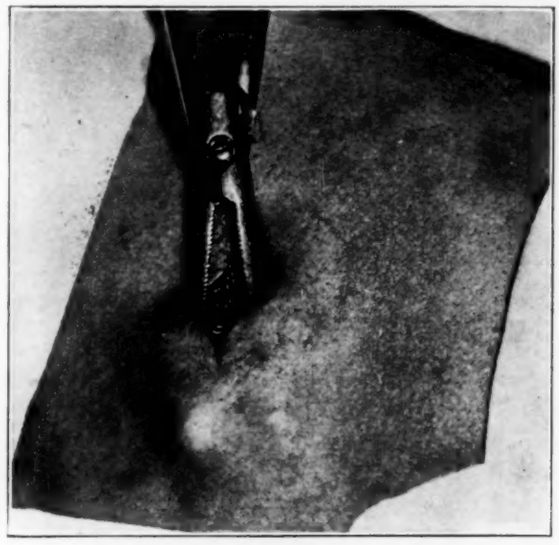

Fig. 47.—Step 3 in implantation technic.

orchiectomy was performed for the same reason. Since then he gradually gained about 25 pounds (11.3 Kg.), became nervous and irritable, frequently became hot and flushed and would break into profuse sweats. His facial hair disappeared almost entirely and his penis slowly grew smaller. The breasts slowly increased in size. All libido disappeared and no erections occurred. His physical examination revealed the status described but was otherwise negative. The blood pressure was 130 systolic and 75 diastolic, and all laboratory studies were negative. He was considered to be a true postoperative castrate or eunuch, and on March 6, 1940 a total of 450 mg. of testosterone was implanted in the form of three 150 mg. tablets. For about four or five weeks thereafter the nervousness, tremulousness, sweating and weak feeling decreased and then disappeared. His sallow, yellowish skin took on a more ruddy appearance. There was some growth of axillary and facial hair. His penis lost its shrunken appearance and seemed to grow, and many erections occurred. He even practiced some masturbation. But by April 21, seven weeks after the implantation, he noticed complete subsidence of the testosterone effects, and he gradually returned to the original status. The pellets were still distinctly palpable. On May 18 eight 50 mg. pellets (400 mg.) were inserted. For two or three weeks there was a suggestion of testosterone effect, but on June 8 it was decided that the effect was negligible. Several more weeks were allowed to elapse, and since he had again returned to the original status he was given a total of 1,000 mg. of testosterone propionate by injection over a period of six weeks during July and August. Feeling improved and disliking the injections, he ceased treatment, believing he was now cured, despite advice to the contrary.

This patient undoubtedly derived some benefit from the first implant, but there was less by far than would be expected, and the duration was much too short. In addition, the pellets remained distinctly palpable. Reimplantation led to a similar experience. It was concluded that we were again dealing with the process of encapsulation. Injections led to what appeared to be definite full response. Of the 30 patients treated by implantation, 3 have failed to respond sufficiently, and we believe that the failure was due to the process of encapsulation which prevented or retarded absorption.

DOSE IMPLANTED AND USE OF FEW LARGE PELLETS VERSUS MULTIPLE SMALL PELLETS

As described, amounts varying from 150 mg. to 900 mg. were inserted. Unquestionably the largest dose gave greater response than the smallest. However, it is conceivable that an optimum dose should be ascertained if possible, for the substance is too valuable to be wasted unnecessarily and indiscriminately. From our observations it appears that from 300 to 450 mg. usually appeared adequate for satisfactory results, but allowances must be made for individual cases. Further, should one implant two 200 mg. pellets, three 150 mg. pellets or six or eight 50 mg. pellets for the most economical and most satisfactory effects? Certainly, overlapping of pellet surfaces reduces the total surface exposed and the amount absorbed per day. Also larger pellets are more likely to fragment, crush and give irregular waves of hasty absorption. Further, the larger pellets require a longer incision and a pocket formation, while smaller pellets are readily inserted without the formation of a scar through a trocar (to be described later). By this method, the small pellets are "strung out" end to end without overlapping and are less likely to fragment, assuring longest possible life with greater efficiency. The surface area of eight 50 mg. pellets is thus greater than four 200 mg. pellets, and probably remains proportionately greater as time and absorption proceeds.

IMPLANTATION METHODS

We chose the posterior axillary line, at about the level of the sixth to the ninth rib. We felt that there was little subcutaneous fat at this site, a likelihood of less trauma, little interference with motion and probably a minimal and uniform effect of muscular and bodily activity.

For the implantation of the larger pellets (150 and 200 mg.) an incision about ¾ inch (2 cm.) in length was made under procaine hydrochloride anesthesia and

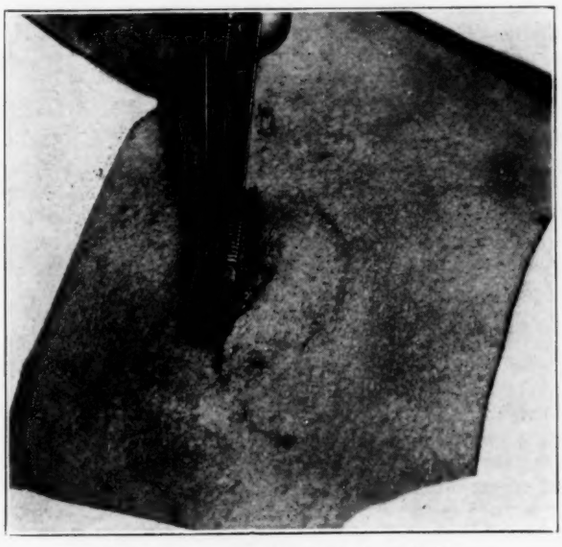

Fig. 48.—Step 4 in implantation technic.

by blunt dissection a pocket about 1 or 2 inches in diameter was made below and away from the incision. Into this pocket the pellets were inserted, and the incision was closed with two or three sutures. Although care was taken to insert the pellets without overlapping, they undoubtedly frequently "bunched" themselves, nevertheless. The sutures were not removed until the seventh day.

For the 50 mg. pellets a trocar was specially constructed so that the diameter of the pellets was that of the trocar. After injection of procaine hydrochloride a minute cutaneous puncture or incision was made (about

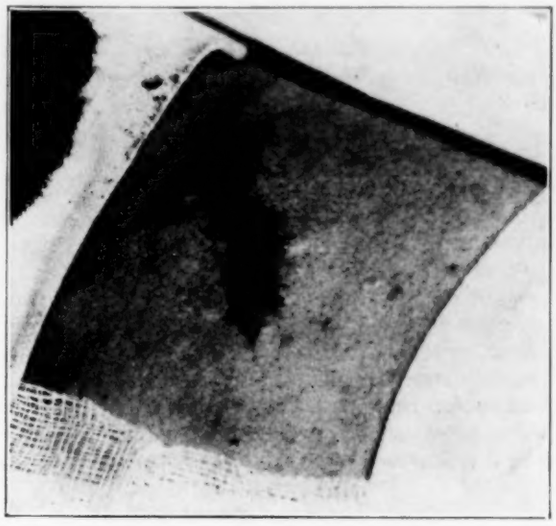

Fig. 49.—Step 5 in implantation technic.

¼ inch [0.64 cm.]) with a sharp pointed scalpel. This facilitated the introduction of the trocar. It was then slowly pushed forward under the skin and the stilet withdrawn. Three or four pellets were then slipped into the hollow and held in place with a plunger, while the trocar cuff was withdrawn and the process repeated at another site, the work being done through the one original puncture wound. By this method the pellets remained in a fixed position end to end as inserted, and with less trauma or bleeding. The puncture wound was closed with one suture to insure prevention of the pellets working their way up and out. Repeated implantations could be made at the same site if desired.

ADVERSE RESULTS AND OBSERVATIONS

Of the total of seventy implantations two were terminated spontaneously at the end of the second and third week by failure of the incision wound to heal with resultant ejection of the pellets. In these instances, both among the earlier implants, the sutures were removed on the fifth day. Also, the pocket formation was so small that the pellets lay too near the incision and were too superficial. After the technic was modified this has failed to recur. There has been no excessive bleeding and no infection. There has been no pain, not even discomfort. The ejection has not occurred with the smaller (50 mg.) pellets inserted with the trocar.

The lack of response, as described, probably due to encapsulation, must necessarily be considered as an adverse result. Several other instances of decreased or partial response did present themselves, probably explainable on the basis of a decrease in absorption due to peri-tablet reaction, or inadequate dosage. That the latter was usually the cause was demonstrated by increased response following reimplantation of larger doses.

In two instances the response seemed exaggerated or excessive, although neither could be classified as severe. These were characterized by excessive libido and erec-

tions and soon disappeared. On reimplanting these patients we used smaller doses, and the response was then considered good and normal.

There have been no unsightly scars, even when reimplantation was performed through the original site. Of course with the trocar method the scar is minimal, negligible or absent.

DURATION OF EFFECTS

The duration of the effects, as determined clinically, has varied from two months to as long as six months, with four months as the average. The shorter periods seemed to occur with pellets that were not well compressed or friable. Fragmentation of the pellets on insertion, or when in situ, would probably hasten their absorption. Of course periodic urinary determination of androgenic content would be a more objective criterion but entails added labor and expense. However, it seems to us that the clinical history and course is an excellent criterion and, if augmented by the urinary androgen determination, offers an excellent means of indication for reimplantation. As observed with injections, some patients regress so slowly that the interval between treatments may be lengthened in individual cases.

SUMMARY AND CONCLUSIONS

We feel that this series of observations justifies the following conclusions:

1. Many patients need continued testosterone therapy, but occasional patients may discontinue therapy after long-continued treatment, or at least may postpone the resumption of treatment after intervals of rest periods.

2. The implantation of pure testosterone tablets offers a means of prolonged and continued therapy which is simple and practicable.

3. Although there may be some exceptions or untoward sequelae, these are thus far so few as not to contraindicate the procedure in general.

4. Undoubtedly much further work is required to determine the best procedure, dosage, frequency and the like.

5. Following seventy implantations, no real accident or complication has occurred, suggesting the comparatively safe and benign character of the method.

6. Finally, we believe that a patient suffering a lack of androgenic substance should first be given injections of testosterone propionate to demonstrate to the patient (and physician) the effects of testosterone administration before implantation is suggested. The patient would then be able to evaluate the effects of the implants. If implants are performed as the primary treatment, the patient has no established criterion to measure the efficacy of this method.

ADDENDUM

Since the foregoing report was submitted, sixty additional implants have been performed, a total of about one hundred and thirty. These are now done with a new trocar, which has a simple beveled point and requires no incision whatever and no suture on removal. The only dressing used is a collodion dressing, removed on the seventh day. The observations and findings, as reported, hold without any modification for the entire group.

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SPOROTRICHOSIS

REPORT OF SIX CASES AMONG FLORISTS

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Sporotrichosis is a rather rare disease clinically seen as one of four general types, namely lymphatic, disseminated nodular, disseminated ulcerated and visceral.[1] The type commonly encountered is the lymphatic, characterized generally by an initial traumatic abscess of the skin followed by a chain of subcutaneous nodules along the course of the lymphatics in two to three weeks. These nodules are painless and later ulcerate. The

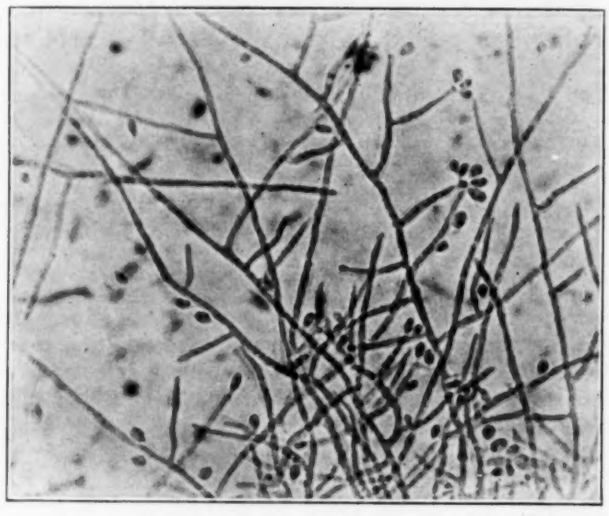

Fig. 1.—Sporotrichum schencki, recovered by aspiration.

ulcers resemble tuberculosis of the skin, syphilitic gumma, staphylococcic infections or tularemia. If the condition remains undiagnosed, the course is prolonged and disabling.

The etiologic agent is the fungus Sporotrichum schencki, named after Schenck, who in 1898 originally described the disease in this country. The fungus is a widespread saprophyte being found in every country. Microscopically the myceliums appear hyaline, fine branching organisms 1 to 2 microns in diameter. The spores are oval to pear shaped and are attached to short lateral branches or longer hyphae.

REPORT OF CASES

CASE 1.—G. F., a youth aged 18, a florist's assistant, was referred by his physician to our office on March 4, 1939. On January 2, he stated, he had run a small piece of steel into the middle finger of the right hand. The injury was considered trivial except that it would not heal. Prior to referral, local medications had been applied, and surgical incisions of the abscess had been performed. About the first of February he had noted a number of "boil-like" lesions ascending the right forearm.

Examination revealed that the boy was well developed and had no abnormalities except the lesion of the right forearm. About the nail of the middle finger one could see an infected

From the Indiana University Medical Center (Dr. Gastineau and Dr. Haynes).
Dr. Spolyar is Chief of the Bureau of Industrial Hygiene of the Indiana State Board of Health.

1. Templeton, H. J., and Lunsford, C. J.: Sporotrichosis on Pacific Coast, Northwest Med. **30**: 132-136 (March) 1931.

area. The surrounding tissue of the finger showed signs of an associated chemical dermatitis due to the previous use of topical applications. On the dorsal aspect of the same finger an ulcerated area discharging ropy pus was present. Ascending lymphangitis of the forearm and the arm was noted, with no involvement of the regional lymph glands. Cultures of material aspirated from lesions of the forearm and the arm, made on Sabouraud's medium, showed S. schencki within five days. Repeated efforts to find the sporothrix on direct smears were not successful. The serologic reactions, as well as the agglutination reaction for tularemia, was negative. The patient was given 15 minims (0.9 cc.) of a solution of potassium iodide three times a day, and improvement was noted in three weeks. Complete healing occurred by May 5. Three months later the lesions were still healed.

CASE 2.—D. N., a man aged 45, a florist, was first seen April 28, 1939, when he gave a history of having injured the right thumb with a splinter on March 15. A chancre developed at the site of injury which ulcerated and discharged ropy material. Typical lymphangitis involving the forearm and the arm was present. No involvement of the regional lymph glands was noted. Cultures of aspirated material showed S. schencki on the fifth day, whereas direct smears persistently failed to do so. The serologic reaction of the blood and the agglutination reaction for tularemia were negative. With potassium iodide therapy, the patient made an uneventful recovery in one month. There was no recurrence.

CASE 3.—A. S., a man aged 65, a florist, was first seen March 28, 1939 in consultation with his family physician. He had injured the thumb of the right hand about Dec. 25, 1938, and the injury would not heal. There was an abscess, which had been opened surgically several times before the establishment of the diagnosis.

Examination revealed an ulcerated area of the right thumb above the nail. Two such areas were present on the forearm, with concomitant lymphangitis above them. Cultures of aspirated material were positive in within six days, and repeated direct smears were negative. Syphilis and tularemia were ruled out. With potassium iodide therapy the patient made an uneventful recovery.

CASE 4.—E. H., a woman aged 55, a florist, was first seen May 8, 1939. She gave a history of having injured the left thumb in October 1938 by having it caught between the doors of a delivery truck. That same afternoon she repotted three hundred plants and worked with sphagnum moss. The injury did not heal, and "some bumps" came out on the forearm. On Feb. 20, 1939 pneumonia developed, for which she was treated at the local hospital. During convalescence, lesions

Fig. 2 (case 4).—Arm, showing ulceration.

similar to those on the right arm appeared on the left arm, forearm and hand. Later, similar lesions appeared on the lower extremities.

Examination on May 5 revealed a number of nodes on the upper and lower extremities. Some areas were ulcerated, while others were in various stages of healing. Cultures were positive for S. schencki in seven days. Repeated cultures of the sputum showed no organisms. Syphilis and tularemia were ruled out. Recovery with potassium iodide therapy was slow; however, with the use of unfiltered roentgen rays in doses of 75 r, healing took place rapidly. Three such doses were administered. Therapy with potassium iodide was continued for four months. There were no recurrences.

CASE 5.—H. L., a man aged 50, who worked part time in an automobile factory in addition to working in his small

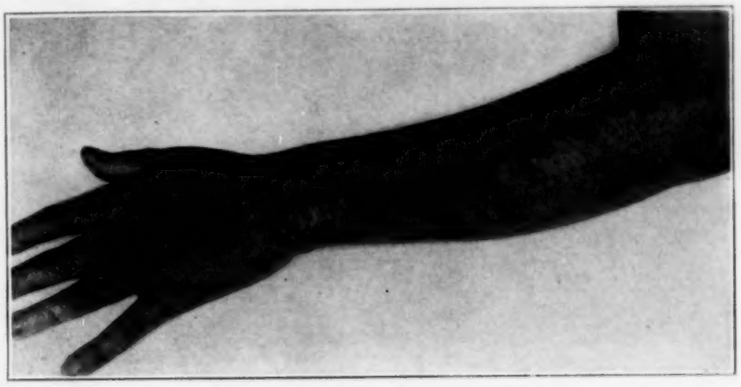

Fig. 3 (case 6).—Typical lymphangitis.

floral establishment, was first seen July 1, 1939. On May 1 he had pricked the ring finger of the left hand with a rose thorn. Within three days infection developed at the site of the injury. Lymphangitis of the forearm developed rapidly. Material aspirated from one of the nodes, cultured on Sabouraud's medium, was positive for S. schencki within six days. Direct smears were persistently negative. Uneventful recovery was made with potassium iodide therapy.

CASE 6.—H. L., a woman aged 40, a florist and the wife of patient 5, was first seen July 3, 1939. On May 15 she had injured the right forefinger at the base of the nail on a rose thorn. When she was first seen typical lymphangitis of the forearm had developed. Cultures of aspirated material showed S. schencki within five days. Syphilis and tularemia were ruled out. The patient made an uneventful recovery within a few weeks with use of a saturated solution of potassium iodide. Six months after recovery there had been no recurrence in either case 5 or case 6.

INDUSTRIAL EPIDEMIOLOGY

The foregoing cases were referred to the Bureau of Industrial Hygiene of the Indiana State Board of Health for further study. Geographically, the patients were in different sections of the state, but all were confined to central Indiana. Patients 5 and 6, husband and wife, worked in the same floral establishment. Of the 6 patients, 2 were women and 4 men, with their age distribution 18 to 65. All 6 had definite evidence of trauma. Tabulation of the raw materials and by-products used revealed that all 6 handled different fertilizers, 3 used peat moss of different brands and all used sphagnum moss, plumosa and flat ferns. One used home-grown carnations, and 1 grew roses. Epidemiologically, the common denominator appeared to be the sphagnum moss, the plumosa or the flat fern. Barberry was not handled in any instance. Because of the work of Hopkins and Benham [2] it was believed that the carnation would not be a vector in this epidemic. All the infections developed between January and July 1939.

Samples of sphagnum moss, peat moss, ferns, fertilizers and carnations were sent to the United States Public Health Service and to the Indiana State Board

2. Hopkins, J. G., and Benham, R. W.: Sporotrichosis in New York State, New York State J. Med. **32**: 595-601 (May 15) 1932.

of Health for culture. Dr. C. W. Emmons, of the division of infectious diseases of the service, cooperated in the study. In a nine month study of the material and by the use of special technics, Dr. Emmons was able to isolate S. schencki from 1 sample of the sphagnum moss. Two patients (5 and 6) handled this particular moss in their routine duties. That they derived their infections from their contacts with this moss would be difficult to establish. Nevertheless, the organism was recovered from a suspected source.

TABLE 1.—*Distribution of Cases of Sporotrichosis by States*

State	Summary by Foerster,[3] 1924	Summary to 1940
North Dakota	26	26
Kansas	14	14
Nebraska	15	17
Illinois	6	9
Missouri	9	14
New York	..	6
Minnesota	..	3
California	..	5
Iowa	..	4
Indiana *	6	6
New Jersey	..	2
South Dakota	4	4
Montana	..	1
Wisconsin	9	15
Oklahoma	11	13
Texas	5	8
Florida	..	2
Maryland	..	2
Pennsylvania	..	2
Tennessee	..	3
Maine	..	1
Colorado	..	6
Virginia	..	1
Connecticut	..	4
Alabama	..	4
Massachusetts	..	1
West Virginia	..	1
Ohio	..	1

* Does not include the 6 cases in our series.

Hopkins [2] stated that the sporothrix had been grown on culture experimentally from the following sources: the bark of a beech tree and a horsetail fern by Gougerot; blighted wheat by Sartory; flies, wasps and ants by de Beurmann; the fur of healthy rats by Lutz and Splendore; the coats of both healthy and diseased horses by Meyer, and carnations by Hopkins, if the carnation was infected by S. schencki and not Sporotrichum poae.

TABLE 2.—*Occupational Status in Reported Cases of Sporotrichosis*

Occupation	Number of Cases
Farmers	46
Gardeners and nurserymen	21
Industrial workers	12
General laborers	13
Stable boys	2
Clerks	4
Florists *	3
Merchants	2
Physicians	2
Sailors	2
Soldier	1
Housewives	18
Berry picker	1
Teacher	1
Rag picker	1
Teamster	1
Druggist	1
Insurance agent	1
Chiropractor	1
Linesmen	2
Molder	1
Office worker	1
Policeman	1
Violin students	2
Minister	1
School children	5

* Does not include the 6 cases in our series.

Among the suspected sources of infection in some of the cases reported in the American literature have been contact with the barberry bush in 15 cases (Foerster,[3] Carter,[4] Wakefield,[5] Blair and Yarian [6] and Weise [7]) contamination from rag picking in 1 (Gallegos [8]); the bite of a boa constrictor in 1 (Gray and Bamber [9]); rat bite in 1 (Anderson and Spector [10]); contact with a cactus plant in 1 (Lewis and Cudmore [11]), and riding a supposedly infected horse in 1 (Beinhauer; [12] the horse later died but the cause of death was not posted).

SUMMARY OF LITERATURE

Since the description of the sporothrix by Schenck in 1898 200 cases had been reported in the United States to 1937, according to Greenburg,[13] with 6 additional ones from 1937 to January 1940, making a total of 206. Study of the literature revealed that our series of 6 cases is the largest on record, and it becomes doubly interesting in that the epidemic was confined to florists. Of the 206 patients described in the literature, 3 were florists. Before this epidemic, 6 cases had been reported in Indiana since 1898. Table 1 indicates distribution of reported cases by states, so far as it is possible to allocate cases to a state.

That the disease is endemic in the Mississippi River basin was shown by Foerster's [3] study, in 1924, wherein he was able to allocate 130 cases to this area. Ten cases which have occurred since then can be definitely added to the number in the basin area. Sixty-seven per cent of the reported cases have occurred there.

TABLE 3.—*Sites of Lesions*

Site	Number of Cases
Distal portion of upper extremity	130
Lungs	14
Hip	2
Leg	23
Eye	9
Neck	5
Entire body	3
Breast	1
Gastrointestinal tract	1

* Does not include the 6 cases in our series.

Sporotrichosis is primarily an occupational disease of agricultural manual workers. An occupational analysis of the cases reported for the United States is shown in table 2.

Since the disease is one affecting agricultural manual workers and tends to be disabling and chronic if not diagnosed early, the worker undergoes an economic loss out of proportion to his disease; he may also suffer a stigma due to a wrong diagnosis. Prompt diagnosis and treatment are essential.

Trauma was noted in 80 of the reported cases. Five deaths have occurred. The age distribution in 112 cases was 18 to 50 years and in 27 cases 2 to 12 years. The reported sites of the lesions are summarized in table 3.

3. Foerster, H. R.: Sporotrichosis, Am. J. M. Sc. **167:** 54-75 (Jan.) 1924.
4. Carter, R. M.: Sporotrichosis: Report of Two Cases, J. A. M. A. **86:** 1751-1754 (June 5) 1926.
5. Wakefield, H.: Sporotrichosis: Case Report, Illinois M. J. **52:** 495-496 (Dec.) 1927.
6. Blair, J., and Yarian, N. C.: Two Cases of Sporotrichosis Infection Due to Barberry, J. A. M. A. **91:** 96 (July 14) 1928.
7. Weise, E. C.: Sporotrichosis in Connecticut, with Case Report, New England J. Med. **205:** 951-955 (Nov. 12) 1931.
8. Gallegos, P. B.: Cutaneous Sporotrichosis, with Case Report, California & West. Med. **26:** 802 (June) 1927.
9. Gray, A. M. H., and Bamber, G. W.: Sporotrichosis with Case, Proc. Roy. Soc. Med. **25:** 668-699 (March) 1932.
10. Anderson, N. P., and Spector, B. K.: Rat Bite Fever Associated with Sporothrix, J. Infect. Dis. **50:** 344-349 (April) 1932.
11. Lewis, G. M., and Cudmore, J. H.: Sporotrichosis: Case Originating in New York, Ann. Int. Med. **1:** 991-999 (Feb.) 1934.
12. Beinhauer, L. G.: Sporotrichosis, Pennsylvania M. J. **39:** 787-791 (July) 1936.
13. Greenburg, W.: Sporotrichosis: Report of Case in California, Arch. Dermat. & Syph. **36:** 355-357 (Aug.) 1937.

SUMMARY

1. In an epidemic of sporotrichosis affecting 6 florists in central Indiana, 4 had received previous surgical treatment for primary lesions. All 6 had a history of trauma. Five had lesions of a lymphatic type, and 1 had generalized lesions. Two were husband and wife and were probably infected from a common source.

2. No other florists with sporotrichosis have been observed by us since this epidemic.

3. Industrial epidemiologic studies indicate that sphagnum moss may be the source of sporotrichosis among florists.

4. The identification of S. schencki in the 6 cases reported provides an example of the manner in which a governmental agency can assist physicians in private practice by doing epidemiologic studies for them.

Hume Mansur Building.

THE EFFECTIVENESS OF TWO NEW TYPES OF CHEMOTHERAPEUTIC AGENTS IN MALARIA

SODIUM P,P′-DIAMINODIPHENYLSULFONE N,N′-DIDEXTROSESULFONATE (PROMIN) AND 2-SULFANILAMIDO PYRIMIDINE (SULFADIAZINE)

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There is need for better antimalarial drugs because of certain fundamental deficiencies in quinine and atabrine. Although both are of great importance to the person with an acute attack of malaria, neither can be relied on to remove the infection completely, and for this reason their effect on malaria from a public health standpoint probably is minimal. In actual attempts to control malaria by the use of quinine, atabrine and plasmochin, the work of Clark, Komp and Jobbins [1] stands out. They state: "Ten years of experience in attempting to control malaria in a number of endemic areas in Panama, by making monthly parasitic surveys, and treating the positives with drugs, leaves us with the impression that it is quite impossible to eradicate malaria parasites by these means or reduce them to a point where transmission is greatly reduced." In addition, not one of these drugs has a true prophylactic action. Their only action when taken in advance of the bite of an infected mosquito is the temporary suppression of a clinical attack.

The discovery that sulfanilamide would effect a complete sterilization of the virulent Plasmodium knowlesi infection in rhesus monkeys [2] has furnished an important lead in the chemotherapy of malaria. Although cases of human malaria failed to respond to this compound, it seemed likely that a related substance might be found which would exert a similar effect in man. Such a drug could be expected materially to reduce the reservoir of infection and thereby diminish transmission of malaria by removal of carriers. Accordingly, investigations were made in an attempt to disclose a drug which would be an improvement over the accepted antimalarials or which would serve as a substitute in case their availability was curtailed. The present report describes the activity of sodium p,p′-diaminodiphenylsulfone-N,N′-didextrose sulfonate (promin) [3] and 2-sulfanilamido pyrimidine (sulfadiazine),[4] which have been found to possess considerable antimalarial activity against infections in lower animals, therapeutic malaria in patients with dementia paralytica, and acute, naturally acquired malaria of native and foreign residents of Panama.

MALARIA INFECTIONS IN LOWER ANIMALS

The acute infection produced in rhesus monkeys by P. knowlesi was selected as one of the test infections because of its uniform behavior, rapid course and almost invariably fatal termination. Chronic infections were obtained by treating the animals with quinine when thin smears first showed parasites.

Sulfanilamide given in doses of 1 Gm. by mouth sterilized acute infections with P. knowlesi.[2] All the parasites present in the host were killed, as proved by complete susceptibility to reinoculation with the same strain of P. knowlesi. Azosulfamide, sulfapyridine, sulfathiazole and sulfadiazine were also effective, although their relative efficiency was not investigated.[5] None of these drugs had any effect on Plasmodium cathemerium infections in canaries, and sulfanilamide had no effect on Plasmodium lophurae infections in chicks.[5] Sulfanilamide and sulfathiazole had approximately the same effect on Plasmodium inui and Plasmodium cynomolgi infections in rhesus monkeys, which was much less than the complete sterilization produced in the case of P. knowlesi. When given to monkeys with acute or chronic P. cynomolgi or P. inui infections, parasites disappeared temporarily from the peripheral blood. However, they reappeared after varying intervals, indicating that the infection had not been completely eradicated, although the dosages used were more than enough to sterilize P. knowlesi infections.

In 1937 Buttle and his associates [6] and independently Fourneau [7] and his associates had shown that 4,4′-diaminodiphenyl sulfone was about one hundred times as active as sulfanilamide in protecting mice against hemolytic streptococci. However, it was about ten times more toxic than sulfanilamide, producing methemoglobinemia and anemia, and consequently could not be used clinically. It was found by these authors that the amino groups caused the toxicity which could be dimin-

A cooperative study from the Laboratories of the International Health Division of the Rockefeller Foundation, New York, and the Gorgas Hospital, Canal Zone, Panama.

Dr. Walsh McDermott, Second Medical Division (Cornell Service), and Drs. Evan Thomas and Gertrude Wexler, Third Medical Division, Department of Syphilology, Bellevue Hospital, arranged for the cases of therapeutic malaria and their clinical supervision.

Brig. Gen. M. C. Stayer, M. C., U. S. Army, Chief Health Officer of the Health Department, Panama Canal, Col. M. A. Dailey, M. C., U. S. Army, and Col. R. G. Harden, M. C., U. S. Army, former and present superintendents of the Gorgas Hospital, gave permission and assistance, making the clinical trial of the compounds possible. Dr. H. C. Clark, director of the Gorgas Memorial Institute, Republic of Panama, gave valuable aid and advice during the investigation.

1. Clark, H. C.; Komp, W. H. W., and Jobbins, D. M.: A Tenth Year's Observations on Malaria in Panama, with Reference to the Occurrence of Variations in the Parasite Index, During Continued Treatment with Atabrine and Plasmochin, Am. J. Trop. Med. **21**: 191 (March) 1941.

2. Coggeshall, L. T.: The Cure of Plasmodium Knowlesi Malaria in Rhesus Monkeys with Sulfanilamide, and Their Susceptibility to Reinoculation, Am. J. Trop. Med. **18**: 715 (Nov.) 1938.

3. Supplied by Parke, Davis & Co.

4. Supplied by Lederle Laboratories, Inc.

5. Coggeshall, L. T., and Maier, John: Determination of the Activity of Various Drugs Against the Malaria Parasite, J. Infect. Dis., to be published.

6. Buttle, G. A. H.; Stephenson, Dora; Smith, Sydney; Dewing, Tom, and Foster, G. E.: Treatment of Streptococcal Infections in Mice with 4: 4′-Diaminodiphenylsulfone, Lancet **1**: 1331 (June 5) 1937.

7. Fourneau, Ernest; Tréfouël, Jacques; Nitti, Federico; Bovet, Daniel, and Tréfouël, Mme. Jacques: Action antistreptococcique des dérivés sulfurés organiques, Compt. rend. Acad. d. sc. **204** 1763 (June 7) 1937. Fourneau, Ernest; Tréfouël, Jacques; Tréfouël, Mme. Jacques; Nitti, Federico, and Bovet, Daniel: Chimiothérapie de l'infection pneumococcique par la di-(p-acétylaminophényl)-sulfone, ibid. **205**: 299, (July 26) 1937.

ished by a chemical combination of other substances with these groups. The 4,4′-diacetyldiaminodiphenylsulfone was found to be almost as effective as the parent compound and relatively nontoxic. This was believed to be due to slow absorption or slow conversion into the active parent substance, so that low blood concentrations were maintained over a relatively long period.

In this laboratory 4,4′-diaminodiphenylsulfone was found to be too toxic to test for activity against malaria, as a single 1 mg. dose by mouth was fatal to 2 canaries. However, the diacetyl derivative was found to exert a slight but definite effect against P. cathemerium infection in canaries. In two experiments 2 mg. was suspended in 0.66 cc. of water and given by mouth for six days. The effect in both was a significant prolongation of the incubation period, which indicated the necessity of further trial in other animals.

Accordingly, diacetyldiaminodiphenylsulfone was tried on P. knowlesi infections in rhesus monkeys. Two normal monkeys were each inoculated intraperitoneally with 100,000 P. knowlesi parasites. Immediately after inoculation 1 was given by stomach tube 0.3 Gm. of diacetyldiaminodiphenylsulfone suspended in water. The dose was repeated daily for six days. The other monkey was untreated as a control. The control monkey first showed parasites in thin smear on the fifth day and died four days later. The treated monkey remained normal during a six week period of observation. When reinoculated, a typical acute infection developed, proving that the inoculation had been protected completely against the original infection and a latent submicroscopic infection had not developed. This experiment was repeated with the same result. The complete protection against infection obtained with this drug is equal to that observed with sulfanilamide and its derivatives and is much greater than the protection afforded by quinine or atabrine.

Buttle and his associates [8] also reported the properties of a derivative of 4,4′-diaminodiphenylsulfone obtained by heating this compound with dextrose. The water-soluble product was found to be less active and less toxic than the diacetyl derivative but was the most active soluble compound tested.

A similar derivative, the sodium salt of 4,4′-diaminodiphenylsulfone N,N′-didextrose sulfonate (promin), was tested against P. cathemerium infections in canaries without demonstrable effect. However, since the drug was known to be excreted very rapidly when given parenterally, it was considered possible that a single daily dose did not result in the maintenance of an adequate blood level. Accordingly, promin was tried in monkeys without further test on P. cathemerium.

Five-tenths Gm. of promin was given intravenously to a normal rhesus monkey daily for six days, beginning immediately after intraperitoneal inoculation with 100,000 P. knowlesi parasites. The monkey remained normal during the observation period of six weeks, after which it was successfully reinoculated with the same strain, and a typical acute infection developed.

TABLE 1.—*The Effect of Promin on Vivax and Falciparum Malaria*

Patient	Age	Race	Type of Malaria	Duration of Acute Attack Before Treatment, Days	Treatment	Results	
						Disappearance of Fever, Days	Disappearance of Parasites, Days
1. F. W.	28	White	Vivax	4	20 Gm. 1st day 40 Gm. 2d day 15 Gm. 3d day 5 Gm. 4th day	2	1
2. F. S.	45	Negro	Vivax	3	30 Gm. 1st day 15 Gm. 2d day 15 Gm. 3d day	3	5
3. S. D.	45	Negro	Vivax	8	20 Gm. daily for 3 days	5	4
4. D. M.	50	Negro	Vivax	8	15 Gm. daily for 4 days	3	3
5. F. P.	29	Negro	Vivax	6	10 Gm. daily for 3 days	Immediate	3
6. N. K.	21	White	Vivax	1	15 Gm. daily for 3 days	2	4
7. G. K.	25	White	Vivax	1	15 Gm. daily for 3 days	6	Persisted
8. J. A.	25	White	Vivax	2	15 Gm. daily for 3 days	2	Persisted
9. R. K.	28	White	Vivax	1	15 Gm. daily for 3 days	2	5
10. R. M.	24	White	Vivax	6	15 Gm. daily for 3 days	5	Persisted
11. J. K.	25	White	Vivax	3	15 Gm. daily for 3 days	3	Persisted
12. W. S.	32	White	Vivax	12	15 Gm. daily for 3 days	1	2
13. J. S.	32	White	Falciparum	14	30 Gm. daily for 3 days	Immediate	Rings 36 hours; gametocytes 10 days
14. J. M.	21	Negro	Falciparum	6	15 Gm. daily for 3 days	Immediate	2
15. O. S.	39	Negro	Falciparum	2	15 Gm. daily for 4 days	2	2
16. J. R.	35	Negro	Falciparum	5	20 Gm. daily for 4 days	3	2
17. H. H.	29	Negro	Falciparum	4	15 Gm. daily for 4 days	2	2

Two normal rhesus monkeys were then inoculated intraperitoneally with an indefinite number (100,000 to 500,000) of P. knowlesi parasites. Promin was given to each animal beginning on the third and fifth day, respectively, after parasites were found in thin blood films. One animal was given 1 Gm. daily for two successive days. The parasite count dropped to a submicroscopic level for one week, at the end of which time the animal had a relapse. Two further doses of 2 Gm. were given, which converted the infection into a chronic one. The second monkey was given 2 Gm. of promin intraperitoneally on two successive days; the parasites rapidly disappeared from the blood and failed to reappear for several months, behavior indicative of a complete sterilization of the infection. This result is equal to that achieved with diacetyldiaminodiphenylsulfone or with sulfanilamide and its derivatives. The failure to eradicate the infection in the first monkey is attributable to the low initial dose employed. It should be pointed out that 1 Gm. of promin contains only about 0.31 Gm. of active agent, the remainder of the molecule consisting of the inactive dextrose-sodium sulfonate radical.

8. Buttle, G. A. H.; Dewing, Tom; Foster, G. E.; Gray, W. H.; Smith, Sydney, and Stephenson, Dora: Action of Substances Allied to 4:4′-Diaminodiphenylsulfone in Streptococcal and Other Infections in Mice, Biochem. J. **32**: 1101 (July) 1938.

One and five-tenths Gm. of promin was given intraperitoneally on four successive days to a rhesus monkey with an acute P. inui infection. Parasites disappeared from the peripheral blood but recurred one month later. One Gm. of promin was given intraperitoneally on three successive days to a rhesus monkey with an acute P. cynomolgi infection. Parasites disappeared rapidly from the peripheral blood, and after three months' observation the animal has not shown a parasitic relapse. It is of interest that the asexual forms of the parasite disappeared first; those remaining the last four days of the infection were all gametocytes. These were demonstrably affected by the drug, having a hyaline, ragged, vacuolated appearance indicative of degeneration. Blood subinoculated into a normal monkey at this time failed to produce an infection.

The possibility of a specific prophylactic effect of promin against the sporozoites of P. cynomolgi was investigated. Three normal rhesus monkeys were given 1 Gm. of promin intraperitoneally on two successive days. Immediately after the second dose the 3 treated animals and 3 untreated controls were each inoculated intravenously with 1 cc. of a suspension of sixteen infected Anopheles quadrimaculatus mosquitoes ground in saline solution, an excessive amount of infective material when compared to the bite of an infected mosquito. All 6 monkeys became infected, parasites being found on the eleventh or twelfth day in all cases, so that no specific prophylactic effect existed under the conditions of this experiment.

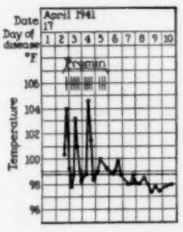

Chart 1 (patient 3, table 1). — Clinical course of S. D., a Negro with a diagnosis of vivax malaria.

In summary, it may be said, 4,4'-diacetyldiaminodiphenylsulfone is as effective against P. knowlesi infections as are sulfanilamide and its derivatives. In addition, it has a slight but definite effect on P. cathemerium infections in canaries. Promin is as effective as sulfanilamide or its derivatives against P. knowlesi, P. cynomolgi and P. inui infections in rhesus monkeys. No effect on P. cathemerium infections in canaries could be demonstrated by the methods used. However, it is possible that the single-dose method of administration, which was used of necessity, and the rapidity of excretion resulted in blood levels of the drug for an insufficient period of time.

ACTION OF PROMIN ON THERAPEUTIC MALARIA IN PATIENTS WITH DEMENTIA PARALYTICA

The promising results obtained on the malaria infections of lower animals indicated the desirability of testing the drug in human beings with active malaria. Toomey and Roach[9] had already given promin intravenously to 154 patients with streptococcic infections and found that untoward reactions were less frequent than with sulfanilamide or sulfapyridine. Thus, with the assurance that the drug could be safely administered, 5 patients with dementia paralytica undergoing malaria therapy were treated at Bellevue Hospital. Treatment was initiated in the first patient, J. B., on the seventeenth day following his inoculation with blood infected with Plasmodium vivax. At this time he had experienced five paroxysms; the peaks of the fever were rising and had reached 106.5 F. the day before the drug was administered. The dosage of promin was 5 Gm. twice a day for three days given intravenously. A definite effect was noted in that the temperature remained within normal limits for three days. There was a reduction in the parasite count but never a complete disappearance of parasites. On the fourth day the temperature was 102 F., and the following day a tertian type of fever was resumed. No further treatment was tried. The next 4 patients likewise had dementia paralytica with active vivax malaria which was treated after they had had ten paroxysms. Each of these patients was also given 10 Gm. of promin daily for three days. Their fever disappeared within forty-eight hours and their blood smears became negative at about the same time.

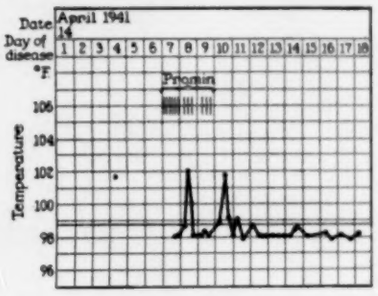

Chart 2 (patient 2, table 1).—Clinical course of F. S., a Negro with a diagnosis of vivax malaria.

There was no recurrence of clinical symptoms or parasites for six days, at which time they received quinine in accordance with the hospital routine. Since most strains of therapeutic malaria are easily influenced by antimalarial drugs and tend to terminate spontaneously, no predictions could be made on the probable behavior of the drug against naturally acquired infections. Also conclusions as to whether the infections were permanently interrupted were unwarranted because of the low rate of relapse associated with blood-induced therapeutic malaria. From these observations it was possible to draw only one important conclusion, namely that the drug possessed definite antimalarial activity against induced vivax malaria.

THE EFFECT OF PROMIN ON NATURALLY ACQUIRED MALARIA

The positive effect of the drug on the malaria infections of patients with dementia paralytica indicated the necessity of a trial against naturally acquired infections, particularly in the acute stages of the disease. An opportunity was provided at the Gorgas Hospital, where 17 patients were treated. The group comprised 8 native Negroes and 9 white residents who had arrived within the past year and were suffering with either vivax or falciparum malaria. The details of the infections, treatment and results are summarized in table 1.

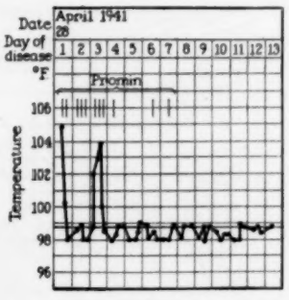

Chart 3 (patient 9, table 1).—Clinical course of R. K., a white man with a diagnosis of vivax malaria.

The vivax infections before treatment were equally severe in white and Negro patients. The majority gave a previous malaria history, although it was not always possible to state whether the present attack was a primary one or a recurrence. The duration of the acute attack preceding the administration of the drug ranged from twenty-four hours to twelve days, which eliminated the possibility of a spontaneous remission. It was interesting to note that 5 of the white patients were on a prophylactic routine of 1 Gm. of quinine a day for five days, a rest period of seven days and this prodcedure repeated, despite which they became acutely ill with malaria. All patients had demonstrable

9. Toomey, J. A., and Roach, F. E.: Promin in the Treatment of Some Acute Infections, J. Pediatrics **18**: 1 (Jan.) 1941.

circulating parasites at the onset of promin therapy. The dosage of the drug varied between 10 Gm. and 40 Gm. a day, given intravenously, for not more than four days.

The results of the test therapy showed that under this arbitrary dosage the 4 Negro patients responded favorably. There was usually one paroxysm following

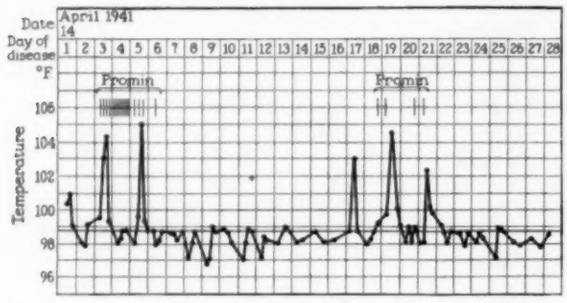

Chart 4 (patient 1, table 1).—Clinical course of F. W., a white man with a diagnosis of vivax malaria.

the beginning of therapy, or two paroxysms if the fever was of the quotidian type (chart 1). The febrile reaction of F. P., who received the smallest amount of drug given to any patient, 10 Gm. daily for three days, was halted, but the parasites persisted and there was a reactivation of the clinical course. The remaining 3 patients, S. D., D. M. and F. S., made a complete clinical recovery, and thick films were still negative one month after treatment.

The vivax infections of the 8 white persons were more resistant to the effect of promin. Patient R. K. was clinically cured and his blood smears had remained parasite free when last examined one month after treatment (chart 3). Six showed clinical improvement, and although the parasite count was definitely reduced an occasional parasite could be detected in the thick smear. These patients were finally treated with quinine and were released from the hospital. The remaining patient, F. W., responded after the initial treatment, but on alternate days, coinciding with the initial periodicity of his paroxysms, his temperature rose to 99 F. and his blood smear was occasionally positive. On the fourteenth day following treatment an exacerbation of symptoms was experienced. He was given two 10 Gm. doses of the drug, each about three hours before the

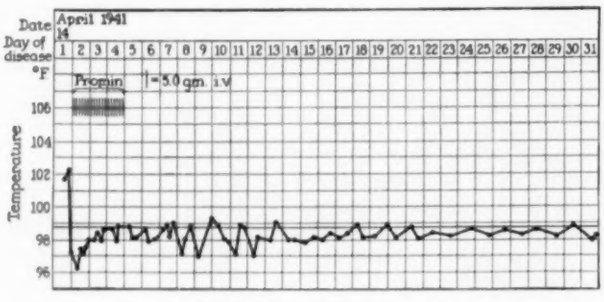

Chart 5 (patient 13, table 1).—Clinical course of J. S., a white man with a diagnosis of falciparum malaria.

expected chill. This time there was a complete clinical recovery, and the blood smears were still negative one month later (chart 4).

There were 5 patients with severe falciparum malaria in the series, all but 1 of whom were Negroes. The dosage of promin was essentially the same as that given to patients with vivax malaria (table 1). Two of the 5 patients, J. S. and J. M., were treated during a period of normal temperature, and the fever did not recur (chart 5). The 1 white patient was acutely ill and slightly icteric on admission. His red cell count was 2,700,000 with a hemoglobin content of 55 per cent. The smear showed many falciparum rings and an occasional gametocyte. Following the onset of treatment the rings disappeared within thirty-six hours, but the gametocytes increased in numbers and persisted for fourteen days. However, it was evident that they were being affected by the drug. They stained poorly. Many had a hyaline appearance and were vacuolated and definitely disintegrated.

Toxic reactions to the drug were minimal. Three patients complained of nausea during the actual administration of the drug, but this symptom disappeared shortly and did not reappear when subsequent injections were made. Two patients showed a moderate degree of cyanosis which disappeared when the drug was discontinued.

The concentration of promin in the blood of a few patients was measured by Mr. Jacob of the board of health laboratory, according to the method of Marshall.[10] Although the number of analyses was small, the results showed that the blood level was extremely

TABLE 2.—*The Effect of Sulfadiazine on Acute Human Malaria*

Patient	Age	Type of Malaria	Duration of Acute Attack Before Treatment, Days	Results	
				Disappearance of Fever, Days	Disappearance of Parasites, Days
1. R. N.....	36	Vivax	1	2	2
2. T. A.....	42	Vivax	4	3	2
3. P. A.....	23	Vivax	3	2	2
4. P. G.....	22	Vivax	18	3	4
5. R. J. F.....	21	Vivax	3	½	2
6. A. H.....	38	Vivax	4	3	5
7. R. J.....	41	Vivax	5	No effect	No effect
8. R. L.....	38	Falciparum	5	3	1
9. B. A.....	32	Falciparum	5	1	2
10. P. E.....	40	Falciparum	5	1	2
11. M. M.....	20	Falciparum	1	No effect	No effect
12. M. C.....	33	Falciparum	3	No effect	No effect
13. S. F.....	22	Quartan	7	2	2

high shortly after the intravenous injection of the drug and fell rapidly to low levels within a relatively short interval.

The results indicated that promin, given in the amounts and under the conditions described, had a definite action on naturally acquired vivax and falciparum malaria. Vivax infections seemed to be more resistant to the effects of promin than falciparum malaria. Both vivax and falciparum infections in the native Negro residents seemed to be more responsive to the treatment than did the same infections in the relatively nonimmune white patients.

THE EFFECT OF SULFADIAZINE ON MALARIA

Although sulfanilamide has been tried on numerous occasions for the treatment of malaria with an occasional favorable report, most investigators feel that its effect on this infection is negligible. In our own experience with 31 cases of vivax malaria in patients with dementia paralytica it was found that even massive doses were practically without effect.[2] However, since it is known that various bacterial infections react differently toward related sulfanilamide derivatives, it seemed worth while to try others on malaria infections. Sulfadiazine was selected for two reasons: first, because certain closely related compounds were found to possess plasmodicidal activity in avian malaria, but their toxicity

10. Marshall, E. K., Jr.: The Determination of Sulfanilamide in Blood and Urine, J. Biol. Chem. **122**: 263 (Dec.) 1937.

precluded clinical trial; second, because sulfadiazine itself was found to be extremely nontoxic and safe for human administration.[11]

Accordingly it was tried in 13 cases of acute malaria in Negro patients, 7 vivax infections, 5 falciparum and 1 quartan. The dosage was the same for all patients, 6 Gm. the first day and 4 Gm. daily for the next five days, given by mouth at four hour intervals during the day. The results are summarized in table 2, in which it can be seen that sulfadiazine exerted a very definite influence against all three types of human malaria. In 2 patients with vivax infections, R. J. and M. M., and 1 with falciparum infection, M. C., this amount of the drug was unable to check the infection. There were no toxic reactions to the drug except in patient S. F., who seemed to respond with fever that promptly subsided on withdrawal of the drug.

COMMENT

It is impossible to state with certainty whether patients have been cured after recovery from their acute attack of malaria following the use of promin or sulfadiazine. There are several authenticated instances in which blood donors have transmitted malaria to recipients as long as twenty-five years after their initial attack. During the interim these donors had lived in nonmalarial areas and were symptom free. The absence of parasites in the blood smears of chronic human infections has no meaning, and it is not possible to subinoculate infected tissue into lower animals for diagnostic purposes as there are no known susceptible ones. Since all patients were discharged and returned to infected territory, any subsequent attacks could as well be new infections as relapses.

In the present study no attempt was made to determine the most efficient dosage of promin because the necessity of intravenous administration limited its usefulness. The results obtained showed that patients responded best when the maximum concentration of the drug was present in the blood at the time of, or shortly before, the sporulation of the parasite. This is in agreement with the finding that, irrespective of the amount given, the drug is excreted extremely rapidly. It seems likely that all the patients would have responded in a satisfactory manner if the drug had been given over a longer period of time, with each dose preceding or immediately following each expected paroxysm.

No explanation was found for the variation in the response of different species of malaria parasites to sulfonamide drugs. It is possible that the effect of sulfanilamide may be correlated with virulence of the infecting organism. P. knowlesi, the most virulent of the experimental malaria parasites, is more readily inhibited by sulfanilamide than are less virulent species, just as virulent strains of streptococci are inhibited by concentrations of sulfanilamide which do not affect less virulent strains. Accordingly various chemicals which were known to be more powerful bacteriostatic agents than sulfanilamide were tested against experimental malarias. It was believed that a drug which produced a demonstrable effect on less virulent species of plasmodia would prove to be more actively plasmodicidal than sulfanilamide and hence might be expected to affect human malaria. The results of the study seem to justify this belief and support the assumption that the greatest effect is against the most virulent infections. The most severe malaria infection in man is produced by P. falciparum, and although there were few cases it responded more readily to promin than the less virulent vivax infections.

11. Finland, Maxwell; Strauss, Elias, and Peterson, O. L.: Sulfadiazine: Therapeutic Evaluation and Toxic Effects on Four Hundred and Forty-Six Patients, J. A. M. A. **116**: 2641 (June 14) 1941.

SUMMARY AND CONCLUSIONS

Seventeen patients acutely ill with vivax and falciparum malaria were treated with sodium p,p'-diaminodiphenylsulfone N,N'-didextrose sulfonate (promin). The results revealed a definite effect on naturally acquired human malaria infections. The vivax infections were more resistant to therapy than the falciparum. The infections in the native Negro residents were more responsive to the drug than the same infections in the relatively nonimmune white patients.

Thirteen patients with vivax, falciparum and quartan malaria were treated with 2-sulfanilamido pyrimidine (sulfadiazine). There was a demonstrable effect in 10 cases but none in 3. Although the effect of this drug was definite, it appeared to be less active than promin when given under the conditions described.

From the observations cited, it seems apparent that there is ample evidence to show that these new types of compounds, unrelated to quinine or atabrine, possess considerable activity against experimental and human malaria and, with related compounds, justify further study.

It should be emphasized that at present there are no reasons for giving the drugs in preference to quinine or atabrine for the treatment of malaria, and they should be regarded only as important substitutes.

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LOCAL SULFONAMIDE THERAPY IN ACUTE MASTOIDITIS

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CHICAGO

The local use of sulfanilamide and its related compounds is increasing rapidly, as indicated by numerous reports in the recent literature. Jensen, Johnsrud and Nelson [1] implanted sulfanilamide crystals in 39 cases of compound fracture and 2 compound dislocations after careful débridement and hemostasis, followed by primary closure of the skin, with no primary wound infection. In 94 similarly treated cases, but without sulfanilamide, 27 per cent showed infection. Key and Burford [2] had a similar experience with compound fractures. They noted also that experimentally produced fractures in rabbits treated locally with sulfanilamide showed as rapid wound and bone healing as those in which the drug was not used. Campbell and Smith [3] treated 54 compound fractures, using sulfanilamide both locally and by mouth. Mueller [4] used it in the peritoneal cavity in 55 cases of abscess and peritonitis following ruptured appendixes, with no mortality. Many other reports have appeared showing good results in the prevention or cure of infections by the local use of sulfanilamide. All stress the prompt

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Ampules of sterile sufathiazole were kindly supplied by Eli Lilly & Co., Indianapolis.

1. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: Local Implantation of Sulfanilamide in Compound Fractures: Preliminary Report, Surgery **6**: 1 (July) 1939.

2. Key, J. A., and Burford, T. H.: Local Implantation of Sulfanilamide in Compound Fractures: Its Effect on Healing, South. M. J. **33**: 449 (May) 1940.

3. Campbell, W. C., and Smith, Hugh: Sulfanilamide and Internal Fixation in Treatment of Compound Fractures, J. Bone & Joint Surg. **22**: 959 (Oct.) 1940.

4. Mueller, R. S.: Use of Powdered Crystalline Sulfanilamide in Surgery, J. A. M. A. **116**: 329 (Jan. 25) 1941.

healing and the absence of irritation or other adverse tissue reactions. No reports to the present date have dealt with this method in the treatment of mastoid infections, although Osgood [5] suggests it in a recent paper.

All the material of the present report consists of cases of acute mastoiditis in children treated since Jan. 1, 1941. Prior to this date the surgical treatment of such cases had consisted of the usual thorough exenteration of all accessible pneumatic cells and necrotic tissue, followed by suture closure with a rubber tube drain from the antrum, emerging from the wound at its lower end. The postoperative course of purulent drainage varied between three and six weeks in most cases. Some drained considerably longer. Occasionally a necrotic broken down wound was encountered which required treatment by the open method with subsequent closure.

In the present series, the first group of cases, attended between January 1 and April 1, was treated as before, with the exception that sulfanilamide crystals were placed in the mastoid cavity before closure. The amount varied from 1 to 3 Gm., depending on the size of the cavity. The usual rubber tube drain was used as before. The subsequent course was disappointing. Purulent drainage ensued as before, and the average postoperative period until complete healing occurred was about the same as if no sulfanilamide had been used. No detailed account of these cases need be given, as they were in no way remarkable. In the second group, comprising all the cases attended after April 1, operation was done in the usual way. The cavity was then filled with crystals of sulfanilamide in some and with crystals of sulfathiazole in others. The wound in each case was sutured tightly without drainage.

REPORT OF CASES

CASE 1.—A. M., a 6 year old boy, was admitted April 10, 1941 with a history that indicated right acute otitis media of four weeks' duration following measles. Mastoid swelling had been present three weeks. The ear did not drain at any time. Examination showed a large fluctuant subperiosteal abscess of the right mastoid. The tympanic membrane was thickened, slightly full and dusky red. The temperature was normal. The leukocyte count was 17,600, with 82 per cent polymorphonuclears. On April 11 mastoidectomy was done, the abscess was evacuated and extensive cellular necrosis was encountered. The mastoid cavity was filled with 2 Gm. of sulfanilamide and the wound was sutured without drainage. On the following day the blood sulfanilamide level was 0.8 mg. per hundred cubic centimeters. Mastoid culture showed Streptococcus hemolyticus. At this time sulfanilamide was started by mouth at a dosage of 60 grains (4 Gm.) daily in six divided doses and was continued for five days. On April 14 the blood level was 5.6 mg. per hundred cubic centimeters. The wound at this time was clean and healthy, and it was remarkable for the absence of soft tissue reaction. There was a scanty amount of bloody drainage from the incision. The ear remained dry. The leukocytes numbered 8,400, with 64 per cent polymorphonuclears. Sutures were removed on April 16, when the wound was found to be completely and solidly healed.

CASE 2.—C. S., a 15 month old girl, was admitted on May 6, 1941 with a history of cervical adenitis and fever that began three weeks earlier. The date of onset of otitis media was not known. Three days before admission, swelling appeared behind the right ear. Examination showed a large fluctuant swelling over the right mastoid, temporal and zygomatic regions. The drum membrane was inflamed and bulging. There was no drainage from the ear. The temperature was 102.8 F. The leukocytes numbered 14,100. Sulfanilamide was started by mouth, 30 grains (2 Gm.) daily, in six divided doses. The following day at operation a large abscess was evacuated. The mastoid was cellular, moderately broken down and filled with pus and granulations. The dura of the middle fossa was found exposed and covered with granulations. Sulfanilamide 1 Gm. was placed in the cavity, and the wound was sutured without drainage. Culture revealed Streptococcus hemolyticus. For the next eleven days the course was afebrile, with gradual diminution of swelling, and a clean wound which healed by primary union. On May 12 the leukocyte count was 6,200. At this time sulfanilamide was reduced to 20 grains (1.3 Gm.) daily and was stopped on May 16. On May 18 the temperature rose to 101.2 F., the leukocytes increased to 16,450 and the mastoid became swollen. On the following day the wound opened at one point and drained a clear, serous fluid. Sulfanilamide was again given by mouth, 20 grains daily. The temperature returned to normal. Drainage ceased May 24, when sulfanilamide was stopped. On June 7 there was again scanty serous drainage but no fever. Thereafter the wound remained dry and firmly healed.

CASE 3.—L. S., a 3 year old boy, admitted on May 9, 1941, had had scarlet fever a month previously followed by a throat abscess, which was incised and drained. After seeming well for ten days he complained of left earache on May 5 and had a temperature of 103 F. The pain and fever persisted. There was tympanic rupture on May 8. On the morning of admission he had a generalized convulsion with weakness of the right arm and leg. The left ear was draining freely. The left mastoid was moderately tender. The boy was very irritable. The temperature was 102.2 F. The leukocyte count was 9,000. Sulfanilamide was started, 30 grains daily in six divided doses. Spinal puncture yielded clear fluid under increased pressure with 17 cells, Pandy negative and sugar 87 mg. per hundred cubic centimeters. The smear and culture were negative. Ear culture showed Streptococcus hemolyticus and Staphylococcus albus hemolyticus. On the following day sulfathiazole 23 grains (1.5 Gm.) daily was added to the sulfanilamide dosage. The temperature ranged between 99 and 104 F. Pain and irritability had disappeared. The ear continued to drain and the mastoid remained tender. The daily peak of fever did not exceed 101.6 F. On May 12 sulfanilamide was stopped, and sulfathiazole was increased to 35 grains (2.3 Gm.) daily. On May 14 swelling of the mastoid was first noted. On May 15 sulfathiazole was stopped and operation was done on the left mastoid. A subperiosteal abscess was evacuated. The mastoid was cellular, with early softening and considerable pus under pressure. The sigmoid sinus plate was found dehiscent by necrosis, and the sinus wall was white, thickened and bathed in pus. The cavity was filled with sulfathiazole 4 Gm. and the wound was sutured without drainage. Culture of the mastoid yielded Streptococcus hemolyticus. The postoperative temperature ranged from normal to 101.6 F. for two days, then remained normal for four days, then rose to 100.6 F. on May 20, 101.4 F. on May 21, 102 F. on May 22, 100.8 F. on May 23 and remained normal continuously thereafter. On the day after operation the dressings were found soaked with a serosanguineous discharge. The wound appeared clean and healthy. Drainage was from the wound and ear. It was thin, clear and slightly blood tinged. This drainage diminished gradually and ceased on the fifth day, when the sutures were removed. Sulfanilamide 30 grains daily was given during the febrile period from May 20 to May 22. The patient was discharged on May 24 with the wound completely healed and dry, the ear dry and the temperature normal.

CASE 4.—J. P., a 4 year old girl, was admitted on May 22, 1941 with a history of measles and pain in the left ear ten weeks earlier. There was no drainage, and the pain subsided in a few days. A month later pain in the left ear recurred, with spontaneous rupture, followed by continuous drainage until admission. Examination showed a profuse purulent discharge from the left ear and tenderness over the mastoid, with periosteal thickening. The temperature was normal. The leukocyte count was 15,600. Sulfathiazole was given on the first day but was stopped on the following day, when ear

5. Osgood, E. E.: Chemotherapy, Arch. Otolaryng. **33**: 961 (June) 1941.

culture showed Streptococcus hemolyticus. Sulfanilamide was given 30 grains daily in six divided doses until June 7. On May 24 the temperature rose to 101 F.; on May 25 it was 100.2 F., on May 26 it was 101. Mastoid operation on May 26 disclosed a cortical fistula and nearly complete necrosis of all cells. The sigmoid sinus and dura of the middle fossa were found exposed and covered by thick granulations. Sulfanilamide 2 Gm. was placed in the cavity, and the wound was sutured without drainage. The entire postoperative course was afebrile. At dressing on the first day a large amount of thin, bloody fluid was found oozing through the incision and from the ear canal. This diminished rapidly and was practically dry on May 30. Sutures were removed on the next day, when the wound was seen to be dry and firmly healed. Scanty serous drainage from the ear continued until June 10. There has been none since.

CASE 5.—J. G., a 6 year old girl, admitted on May 22, 1941, had had measles two months previously, followed by chickenpox two weeks later, when bilateral earache appeared, with spontaneous rupture. The left ear drained for three weeks; the right continued until admission. Right mastoid swelling appeared on May 21. Examination revealed profuse purulent drainage from the right ear and slight swelling over the right mastoid. The temperature was 101.2 F. The leukocytes numbered 14,900. Sulfathiazole was started but was changed to sulfanilamide 50 grains (3.25 Gm.) daily, when on the following day culture showed Streptococcus hemolyticus. The temperature became normal. Operation on the right mastoid on May 26 disclosed a subperiosteal abscess, extensive cellular necrosis and a perisinal abscess. Sulfanilamide 2 Gm. was placed in the cavity, and the wound was sutured without drainage. Mastoid culture yielded Streptococcus hemolyticus. On the first postoperative day the dressings were soaked with a large amount of blood tinged serous fluid. This came from both the wound and the ear. The mastoid was greatly swollen by a large hematoma. The swelling and drainage diminished progressively. The sutures were removed on May 31. At this time the temperature rose to 102.3 F. and a generalized eruption was seen. Since this was recognized as a toxic drug reaction, sulfanilamide was stopped. The temperature was normal the next day. On June 4 the wound was dry and healed, and all swelling had disappeared. There was no discharge from the ear.

CASE 6.—B. K., a 6 year old boy, was admitted on May 24, 1941 with a history of a discharge from the right ear for three weeks and a mastoid swelling for ten days. Examination showed a fluctuant, tender swelling over the right mastoid and profuse purulent drainage from the right ear. The temperature was normal. The leukocyte count was 15,100. At operation on May 26 a large subperiosteal abscess was evacuated and a necrotic cellular mastoid was found. Sulfanilamide 2 Gm. was placed in the cavity, and the wound was sutured without drainage. Ear and mastoid cultures showed Streptococcus hemolyticus. The entire course was afebrile. Sulfanilamide was given by mouth, 40 grains daily, in divided doses, beginning on May 27, for four days. There was a considerable amount of serosanguineous drainage from the wound and ear, which decreased progressively. The wound was healed and dry on May 31. There was scanty bloody discharge from the ear, which ceased two days later.

CASE 7.—A. S., a 4 year old boy, admitted May 28, 1941, had been sick for four days with a cold, fever and cervical adenitis. He had a convulsion on the day of admission. The left ear was then draining profusely. The right drum membrane was inflamed and slightly full. The temperature was 101.2 F. The leukocyte count was 12,250. Sulfanilamide was started, 40 grains daily in four divided doses. The temperature continued to rise to about 101 F. daily. Right myringotomy on May 31 yielded pus, which drained for four days. The left ear continued to drain profusely. Sulfanilamide was reduced to 30 grains daily on June 3 and was stopped on June 5. There was about 1 degree elevation of temperature from June 3 to June 7. Sulfanilamide 40 grains daily was resumed on June 7 and continued until June 14. During this period there was no fever. Roentgenograms showed a well pneumatized, normal mastoid on the right side. The left showed extensive coalescence. Ear culture yielded Streptococcus hemolyticus. On June 14 the left mastoid became tender. On June 16 left mastoidectomy was done. The entire mastoid was necrotic. The cavity was filled with sulfanilamide 2.5 Gm. and the wound was sutured without drainage. Mastoid culture showed Streptococcus hemolyticus. On June 17 the blood sulfanilamide level was 1.5 mg. per hundred cubic centimeters. There was a great deal of serosanguineous drainage from the wound and ear, which diminished only slightly during the next ten days. During this period the patient was afebrile. On June 27 the temperature rose to 103.2 F., the mastoid became swollen and tender, and the ear discharge was frankly purulent. On the following day two fistulas appeared in the wound, draining pus. Daily sulfanilamide irrigations through the upper fistula were started according to the method described by Herrell and Brown.[6] This consists of a suspension of 2 Gm. of sulfanilamide in 100 cc. of aqueous 0.8 per cent solution of sulfanilamide. Little if any of the crystals left the syringe, however, so one must assume that the fluid contained only 0.8 per cent of the drug. From this time on the temperature remained normal. Drainage from the wound and ear diminished slowly. The wound was healed and dry on July 18. The ear was dry two days later. This is the only case of this series in which purulent drainage occurred after operation.

CASE 8.—A. H., a 6 year old girl, who was admitted June 4, 1941, had had several attacks of bilateral acute suppurative otitis media in the past six months, which had resolved without complications. The present sickness began three weeks previously with a cold, pain in the left ear and spontaneous rupture. Mastoid swelling appeared a week later. Ear drainage stopped three days before admission. Examination showed a subperiosteal abscess over the left mastoid and zygoma. The drum membrane was red and bulging, but there was no discharge. The temperature was 100.4 F. The leukocyte count was 10,300. On June 6, at operation, a large subperiosteal abscess was drained. The mastoid was cellular and extensively necrotic. Sulfanilamide 4 Gm. was placed in the cavity, and the wound was sutured without drainage. Culture showed Streptococcus hemolyticus. No sulfanilamide was given by mouth at any time. The sulfanilamide blood level on the day after operation was 4.7 mg. per hundred cubic centimeters. On the third day it was 0.95 mg. The entire postoperative course was afebrile. There was profuse serosanguineous drainage from the wound and ear, which diminished progressively. On June 14 all swelling had disappeared, the wound was dry and healed, and the ear had stopped draining.

CASE 9.—A. T., a 7 year old girl, admitted on June 11, 1941, had had suppuration of the right ear with scarlet fever two years previously. At that time a subperiosteal abscess had been drained without mastoidectomy. The ear has drained intermittently since. Six weeks before admission, following a cold, the ear began to drain profusely, and swelling appeared in front of the ear. This subsided in a few days but reappeared three days before admission. Examination showed a tender, nonfluctuant swelling over the right zygoma. There was scanty purulent drainage from the ear through a large central perforation of the pars tensa. The temperature was 101.2 F. The leukocyte count was 12,200. During the next two days the swelling spread to the temporal and mastoid regions and became fluctuant. At operation on June 14 a large subperiosteal mastoid and zygomatic abscess was evacuated. The bone showed advanced necrosis throughout. There was no evidence of previous mastoid surgery. No cholesteatoma was found. Sulfathiazole 3 Gm. was placed in the cavity, and the wound was sutured without drainage. Culture yielded Streptococcus hemolyticus. There was considerable drainage of bloody serous fluid from the wound and ear for two days. This then diminished rapidly. On June 23 the wound was healed. Scanty serous drainage continued from the ear for eight days. The entire course was afebrile.

6. Herrell, W. E., and Brown, A. E.: Local Use of Sulfamido Compounds in Treatment of Infected Wounds, Proc. Staff Meet., Mayo Clin. **15**: 611 (Sept. 25) 1940.

CASE 10.—N. C., an 8 year old girl, admitted on June 29, 1941, had had chickenpox five weeks previously, followed by measles. The right ear ruptured spontaneously three weeks before admission. The patient then had a high fever and was given sulfathiazole for one week, when the temperature became normal, remaining so until two days before admission, when it rose to 102 F. The ear discharged profusely throughout. On admission, the right mastoid was quite tender. Roentgenograms showed a large celled mastoid with signs of early coalescence. The temperature was 102.6 F. The leukocyte count was 14,800. The temperature rose to 101 F. daily until July 2, when right mastoidectomy was done. Extensive necrosis was found. Sulfathiazole 2.5 Gm. was placed in the cavity, and the wound was sutured without drainage. Streptococcus hemolyticus and Staphylococcus aureus were found in cultures of the aural discharge. Culture of the mastoid pus showed the streptococcus alone. The temperature rose to 101.6 F. on the first postoperative day, to 100.8 F. on the second, and then returned to normal. There was moderate blood tinged serous drainage from the wound and ear. The wound was dry on the fourth day. On the seventh the temperature was 101 F. A small quantity of serous drainage issued from the lower end of the incision. The rest of the course was afebrile. The ear remained dry. The wound was dry and firmly healed two days later and has remained so.

CASE 11.—E. C., a 3½ year old boy, was admitted on July 2, 1941 with a history of pain in the left ear one week previously and spontaneous rupture on the same day. Mastoid swelling appeared four days later. Examination showed a fluctuant swelling over the left mastoid and profuse purulent aural discharge. The temperature was normal. The leukocyte count was 15,400. Sulfathiazole 30 grains daily was given from July 2 to July 4. At operation on July 4 a subperiosteal abscess was evacuated. The mastoid was small celled with scanty necrosis. The lateral sinus was found exposed 1 cm. below the knee and was covered with thick granulations. Further exposure to the normal sinus wall showed the granulations to extend 4 cm. posterior to the knee. Sulfathiazole 2 Gm. was placed in the cavity and over the exposed sinus. The wound was sutured without drainage. Cultures of pus from the ear and mastoid yielded pneumococcus type I. Since the extensive sinal granulations did not seem compatible with an ear infection that had begun only a week earlier, the parents were questioned as to previous ear infection. It was then learned that the child had had measles in March, with left earache for a few days, but no drainage. It was assumed, therefore, that the first attack of otitis media initiated the perisinal invasion. The postoperative course was afebrile. There was scanty blood tinged serous drainage from the wound and the ear for three days. The sutures were removed on the fourth day, when the patient was discharged with the wound healed and the ear dry.

CASE 12.—M. K., a 3 year old girl, was admitted on July 2, 1941 with a history of right otorrhea for two weeks and mastoid swelling for three days. Examination showed a fluctuant swelling over the right mastoid and zygoma, and profuse purulent drainage from the ear. The temperature was normal. The leukocyte count was 14,700. Sulfathiazole was given, 30 grains daily for two days. At operation on July 4 a zygomatic mastoid abscess was drained, and moderately advanced necrosis of the cells was found. Sulfathiazole 2 Gm. was placed in the cavity, and the wound was sutured without drainage. Cultures of pus from the ear and mastoid produced Streptococcus hemolyticus. The postoperative course was afebrile. There was scanty ear and wound drainage for three days. The sutures were removed on the fourth day, when the wound was found healed and the ear dry.

CASE 13.—L. R., a 17 month old girl, was admitted on July 5, 1941 with a history of right ear discharge for two and one-half weeks. Mastoid swelling appeared two days before admission. Examination showed a fluctuant swelling over the right mastoid and profuse purulent aural discharge. The temperature was normal. The leukocytes numbered 6,100. At operation on July 7 a subperiosteal abscess was drained and necrotic cells were exenterated. Sulfanilamide 2 Gm. was placed in the cavity, and the wound was sutured without drainage. Culture of the mastoid pus yielded Streptococcus hemolyticus. The postoperative course was afebrile. There was moderate bloody drainage from the wound and ear for three days. Sutures were removed on the fifth day, when the ear was dry. There was a 1 cm. separation of the skin margins at the middle of the wound, but no drainage. The wound was completely healed on the eighth day.

COMMENT

The foregoing histories represent all the cases of acute mastoiditis operated on to the present time, in which implantation of sulfonamide derivatives and tight closure were used. The series is small, but for the types of cases described the method has proved to be eminently successful. There has been no opportunity as yet to use this method for otogenic sepsis or otitic meningitis. Eleven of the 13 patients had subperiosteal abscess, 4 had perisinal abscess, 2 had extradural abscess and 1 had threatened intracranial invasion, as was evidenced by a convulsion and hemiparesis. The average healing time for all the patients was ten days. The shortest was four days and the longest, with two exceptions, was nine days. These were case 2, in which final healing took thirty days because of two recurrences of the serous discharge, and case 7, in which healing took thirty-one days and which was the only case in which purulent drainage occurred. In case 10 also there was a slight recurrence of serous drainage on the seventh day after having been healed for four days. All the others healed by primary union. The average healing time of the 11 successful cases was six and four-tenths days. The appearance of the wound in all the patients was remarkable for the absence of postoperative inflammatory soft tissue reaction. None showed suture suppuration. In the cases of subperiosteal abscess there was rapid progressive diminution of swelling, which usually disappeared entirely in three or four days. All the children had a moderate to profuse amount of blood tinged serous drainage from the wound and ear for one to three days, which then subsided rapidly. Only patient 7 had purulent drainage after initial healing. A dry ear resulted in every case. Eight of the patients had no postoperative fever. Patient 3 had a daily temperature rise to between 101 and 102 F. for seven days. Two others had slight fever for a day or two. The fourth febrile patient had a rise to 103.2 F. for one day on the eleventh postoperative day, coincident with a sulfanilamide rash. All the cultures showed Streptococcus hemolyticus with the exception of those of patient 10, in which pneumococcus type I was found. This patient and four others were treated locally with sulfathiazole. The rest had sulfanilamide. There was no significant difference between the two groups. Five patients received sulfanilamide by mouth after operation. Their course was in no way different from the course of those who had no peroral medication. Patient 1, in whose mastoid 2 Gm. of sulfanilamide was used, none being given by mouth before operation, had a sulfanilamide blood level of 0.8 mg. per hundred cubic centimeters on the day after surgical operation. Case 8, in which 4 Gm. of sulfanilamide was used locally but none was given by mouth, showed a blood level of 4.7 mg. per hundred cubic centimeters twenty-four hours after operation and 0.95 mg. on the third postoperative day.

The experience gained by the foregoing cases shows that it is entirely feasible to close a mastoid wound without drainage if the cavity is filled with sulfanilamide or sulfathiazole. In nearly all the cases the

wound healed in a remarkably short time and the long tedious period of dressings was eliminated. The absence of local inflammatory reaction indicates not only that there is a prompt elimination of infection but also that the drugs have no adverse effect on the tissues. Recent experimental studies further support the rationale of the local use of sulfonamide compounds. According to the hypothesis of Woods,[7] the bacterial inhibitory action of sulfanilamide consists in its interference with the bacterial enzyme reaction involved in the utilization of para-aminobenzoic acid, a compound essential to bacterial metabolism. He has shown that para-aminobenzoic acid is a sulfanilamide inhibitor. McLeod[8] has demonstrated the presence of sulfanilamide inhibitor in pus. This explains the frequent failure of sulfanilamide therapy in suppurative lesions, since a sufficiently high concentration of the drug to produce bacteriostasis cannot be brought by the blood stream containing the usual 5 to 10 mg. per hundred cubic centimeters. The local implantation of sulfanilamide, however, gives such a high concentration as to overcome the inhibitory action of the pus. Jensen and his colleagues[1] estimated the local concentration of sulfanilamide in compound fractures twenty-four to thirty hours after closure to be from 250 to 666 mg. per hundred cubic centimeters after implanting 5 to 10 Gm. It is generally believed that the action of sulfanilamide is solely bacteriostatic and that the natural defense mechanisms of the body effect the final elimination of infection. It is important to note, however, that sulfanilamide does not interfere with these mechanisms and may even stimulate them. King[9] showed that in the presence of 1 : 1,000 sulfanilamide the granular leukocytes of rabbit blood in tissue culture migrate at a more rapid rate than in the control cultures. Finkelstein and Birkeland[10] found that sulfanilamide stimulates phagocytosis and leukocytosis in the presence of fresh plasma and serum in guinea pigs. The healing of wounds was not hindered by sulfanilamide, as was demonstrated in the present study, in which prompt and firm healing was noted in nearly all the cases. Taffel and Harvey[11] found that sulfanilamide by mouth does not inhibit the healing of experimental stomach wounds in rats and does not reduce the tensile strength of the healed wound.

The question of which drug to use locally has not been settled by the present study. Sulfanilamide and sulfathiazole were found to be equally effective in the streptococcic cases. In the one pneumococcic case, sulfathiazole was used. If the identity of the organism is not known at the time of operation, sulfathiazole is the drug of choice. Sulfadiazine, which is reported to be effective against a larger variety of bacteria, has not been used. Future experience may favor the use of some of the more recently synthesized sulfonamide compounds.

The danger of acute toxicity is negligible. The largest amount of sulfanilamide used was 4 Gm., which completely fills a large mastoid cavity. In the smaller cavities, proportionately smaller amounts were used. With 4 Gm. implanted, the blood concentration in twenty-four hours was 4.7 mg. per hundred cubic centimeters and in seventy-two hours it had dropped to 0.95 mg. Thus with maximum local dosage the greatest systemic concentration of the drug was less than is usually maintained by oral administration and is present for only a day or two.

Closure of a mastoid wound without drainage is not new. Reik[12] described the method which Blake advocated many years ago, which he called the blood clot method. After a very careful exenteration of the mastoid he allowed the cavity to fill with blood and sutured tightly. He reported a high percentage of wounds healed by primary union. In the experience of most otologists the method has not proved successful in a sufficiently large proportion to warrant its routine use. With the local use of sulfonamide compounds, complete closure of the mastoid has resulted in primary healing in nearly all cases.

SUMMARY

A new procedure in the surgery of acute mastoiditis consists in the local implantation of sulfanilamide or sulfathiazole crystals in the cavity and tight closure of the wound. Experience in a series of cases shows that the postoperative period is greatly shortened and that primary healing may be expected in nearly all cases.

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7. Woods, D. D.: Relation of p-Aminobenzoic Acid to Mechanism of Action of Sulfanilamide, Brit. J. Exper. Path. **21**: 74 (April) 1940.
8. McLeod, C. M.: Inhibition of Bacteriostatic Action of Sulfonamide Drugs by Substances of Animal and Bacterial Origin, J. Exper. Med. **72**: 217 (Sept.) 1940.
9. King, J. T.: The Effect of Sulfanilamide on Blood Leukocytes, Am. J. Physiol. **123**: 119 (July) 1938.
10. Finkelstein, Robert, and Birkeland, J. M.: Mode of Action of Sulfanilamide and Prontosil, Science **87**: 441 (May 13) 1938.
11. Taffel, Max, and Harvey, S. C.: Effect of Sulfanilamide on Wound Healing, Proc. Soc. Exper. Biol. & Med. **45**: 647 (Nov.) 1940.

THE EARLY DIAGNOSIS OF ACUTE SPINAL EPIDURAL ABSCESS

REPORT OF AN ILLUSTRATIVE CASE

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Acute spinal epidural abscess is a disease unfamiliar to most physicians. It is rarely diagnosed before the onset of irreparable damage to the spinal cord, and the true nature of the process is often discovered only at postmortem examination. We are reporting the following case to illustrate a sequence of symptoms and signs important in arriving at an early diagnosis. Prompt treatment will save the patient from lifelong disability or death.

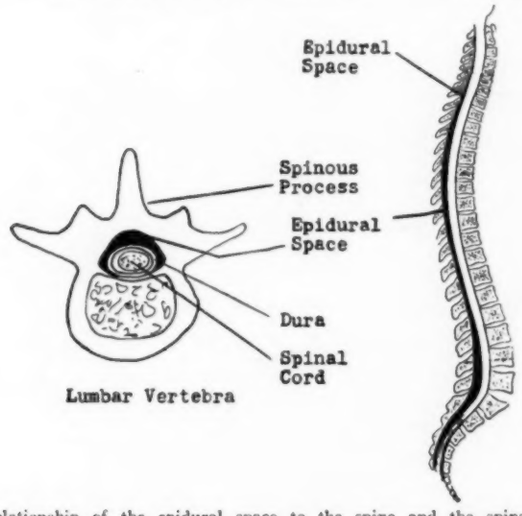
REPORT OF CASE

I. P., a white girl aged 18, was admitted to the Montefiore Hospital July 7, 1937. The history was significant in that the patient had been operated on for acute and recurrent osteomyelitis eight times between February 1930 and December 1936. The right scapula, a rib, the left femur and the right femur had been involved. The patient was first seen on July 4, when she complained of severe pain in both loins and in the lumbar region. This pain had been constant since July 1, when a roentgenogram of the spine was found to be normal. During the eleven days prior to July 1 the patient continued to work as a stenographer, despite mild backache. Physical examination on July 1 revealed that the oral temperature was 101 F., the pulse rate 100 and the respiratory rate 15. The general physical examination gave negative results except for revealing moderate tenderness on percussion at both costovertebral angles, with slight tenderness over the lumbar and lower thoracic portions of the spine. The neurologic examination gave negative results. A voided specimen of urine contained a few pus cells, but no albumin or red cells. On July 5 and 6 pain in the back was severe, constant and unrelieved by opiates. The oral temperature fluctuated from 100 to 102.5 F. There were moderate sweating, slight chilliness, headache and nausea. The tenderness

12. Reik, H. O.: Simple Mastoidectomy by the "Blood Clot Method," in Jackson, Chevalier, and Coates, G. M.: The Nose, Throat and Ear and Their Diseases, Philadelphia, W. B. Saunders Company, 1929, p. 564.

From the Montefiore Hospital; Isaac Kaufmann Foundation.

increased over the lower thoracic and lumbar portions of the spine, but the maximum tenderness was at the costovertebral angles. On account of the previous history of osteomyelitis, it was felt that the diagnosis rested between a perinephric abscess or a cortical abscess of the kidney and acute osteomyelitis of a vertebra, with or without an epidural abscess. The neurologic examination again gave negative results. On July 7 at 2 p. m. the pain was severe, the temperature 103 F. and the pulse rate 110. Reexamination of the patient revealed a new condition, namely, a diminution of the left lower abdominal reflex. There was a questionable increase in the left knee jerk, but no other pathologic reflexes were obtained. There were no objective motor or sensory abnormalities. The sphincters were apparently intact, although there was a history of slight frequency of urination of a few hours' duration. On further questioning, it was found that a sense of heaviness of the legs with slight numbness of the toes had developed in the past few hours. With the development of slight but definite neurologic signs and symptoms a diagnosis of acute spinal epidural abscess was made. Spinal tap was performed at the third lumbar interspace. Complete subarachnoid block was present on compression of the jugular vein. The spinal fluid was clear and slightly xanthochromic and contained 100 mg. of protein per hundred cubic centimeters. The patient was



Relationship of the epidural space to the spine and the spinal cord (after Browder and Meyers.[4]).

admitted to the hospital at 6 p. m. The leukocyte count was 12,600, and a catheterized specimen of urine was essentially normal. Because of the uncertainty of localization of the abscess, a spinal needle was carefully introduced between the eleventh and twelfth dorsal vertebrae, the site of maximum spinal tenderness. The needle was cautiously inserted to the level of the epidural space, with suction applied frequently. A drop of pus was obtained from the needle. Laminectomy was performed at 10 p. m., approximately eight hours after the detection of the abnormal neurologic signs. The spines and laminas of the vertebrae from the eleventh thoracic to the first lumbar were removed. A thin layer of granulation tissue was found at the twelfth dorsal vertebra, beneath which a considerable amount of thick, creamy pus was found. A small catheter was inserted superiorly and inferiorly for a distance of 5 cm., but no further pus was obtained. The pus yielded Staphylococcus aureus. No gross evidence of osteomyelitis was seen, but on the seventh postoperative day a sequestrum was removed from the wound that showed histologic evidence of chronic osteomyelitis. The postoperative course was uneventful. The patient was discharged, after a stay of twenty-seven days, with normal function and no abnormal neurologic signs. During the past four years there has been no recurrence of symptoms or signs of epidural disease.

Etiology.—The organism most frequently associated with spinal epidural abscess is Staphylococcus aureus. The streptococcus, Bacillus pyocyaneus, the typhoid bacillus, the pneumococcus and the gonococcus have also been found in this lesion.[1]

Anatomy.—In order to grasp the nature of the pathologic condition in acute epidural spinal infection, with its resultant clinical picture, an appreciation of the anatomy is important. This has been discussed fully by Dandy.[2] In the accompanying illustration are shown some of the essential features of the epidural space, which extends from the foramen magnum to the sacrum and lies almost entirely posterior and posterolateral to the cord. It communicates with the intervertebral foramens [3] where it surrounds the nerve roots but not with the cranium, since the dura is tightly adherent to the foramen magnum.

Pathogenesis.—Infection of the spinal epidural space may occur by metastasis from a distant focus of infection, such as a furuncle, or by direct extension from an adjacent focus of infection. The infection may also follow a variety of acute infections, such as infection of the upper respiratory tract, otitis media, sore throat, acute bronchitis, pneumonia, osteomyelitis, mastoiditis, phlebitis, appendical abscess, cellulitis and puerperal sepsis.[4] Some authors [5] have expressed the belief that the infection always begins as acute osteomyelitis of the vertebra, whence it spreads to the adjacent epidural space. It is our belief from study of the literature and our own clinical experience that this may be true in the majority of cases. But infection may enter the epidural space by metastasis or through the intervertebral foramens as an extension of the infection from the neck, mediastinum [2] or retroperitoneum without previous osteomyelitis. The inevitable result of untreated epidural abscess is serious damage to the spinal cord. This may occur by direct compression of the cord or by interference with its local supply of blood [6] or lymph.[7]

Pathology.—Regardless of the origin of the epidural abscess, that is, by direct extension or by metastasis from a distant point, the lesion consists of a variable amount of pus and granulation tissue. It may consist of free pus and extend the entire length of the epidural space, from the foramen magnum to the sacrum.[8] Frequently pus gravitates to the lumbar region from a thoracic or cervical lesion.[9] Infrequently does one find, as in our case, a circumscribed lesion,[10] localized to one or several segments of the cord. This paper is concerned only with epidural abscess. The epidural granuloma, consisting of a mass of sclerotic tissue with little or no pus, has been described by others.[11]

1. Fay, Temple, in discussion on Thorner, M. W.; Alpers, B. J., and Yaskin, J. C.: Acute Ascending Paralysis (Landry's Paralysis), Arch. Neurol. & Psychiat. **44**: 17 (July) 1940. Browder and Meyers.[4]
2. Dandy, W. E.: Abscesses and Inflammatory Tumors in the Spinal Epidural Space, Arch. Surg. **13**: 477 (Oct.) 1926.
3. Pincoff, M. C.: Purulent Spinal Perimeningitis, Tr. A. Am. Physicians **41**: 246, 1926.
4. Browder, Jefferson, and Meyers, Russell: Infections of the Spinal Epidural Space: An Aspect of Vertebral Osteomyelitis, Am. J. Surg. **37**: 4, 1937.
5. Hunt, R. J.: Acute Infectious Osteomyelitis of Spine and Acute Suppurative Perimeningitis, M. Rec. **65**: 641, 1904. Browder and Meyers.[4]
6. Elsberg, Charles: Surgery of the Spinal Cord, in Nelson Loose-Leaf Living Surgery, New York, Thomas Nelson & Sons, 1927, vol. 2, p. 459.
7. Hassin, G. B.: Circumscribed Suppurative (Nontuberculous) Peripachymeningitis, Arch. Neurol. & Psychiat. **20**: 110 (July) 1925.
8. Spencer, W. H.: A Case of Idiopathic Inflammation of the Spinal Dura, Lancet **1**: 836, 1879.
9. Cohen, Ira: Epidural Spinal Infections, J. Mount Sinai Hosp. **5**: 219, 1938.
10. Craig, W. McK., and Doyle, J. B.: Metastatic Epidural Abscess of Spinal Cord, Ann. Surg. **95**: 58, 1932. Hassin.[7]
11. Watts, J. A., and Mixter, J. W.: Spinal Epidural Granuloma, New England J. Med. **204**: 1335, 1931. Barker, L. F.: Symptoms of Compression of Upper Spinal Cord Markedly Relieved by Excision of Mass of Epidural Granulation Tissue, Following upon Chronic Staphylococcic Infection of Adipose Tissue of Spinal Cord, Internat. Clin. **1**: 1, 1932. Cohen.[9]

SYMPTOMS

A review of the reported cases reveals a characteristic clinical picture. There is usually but not always a history of an acute infection such as a boil or of trauma to the spine at some time prior to the onset of the symptoms. Among 85 cases in which it was possible to determine the interval between onset of acute infection or trauma and development of pain in the back, the interval varied from one day to three years, with an average of four and two-tenths weeks. In our case the interval was approximately seven months.

The earliest and most important symptom is pain in the back. The pain may be gradual or sudden in onset, growing increasingly severe and persistent. It varies in position, depending on the location of the lesion. At the onset it is usually localized, but it may become diffuse in late stages. Referred or radicular pain is common. In unusual instances,[12] the root pain may be present alone, making the diagnosis extremely difficult. With a cervical lesion the root pain may be distributed to the shoulders or upper extremities. With a thoracic or lumbar lesion, because of the distribution of pain, patients have often been described as having "pleurisy," "myositis," "cholecystitis," "lumbago," "perinephric abscess or cortical abscess of the kidney," "intercostal neuralgia" or "sciatica." Abdominal pain and tenderness may mimic the pain and tenderness of an acute abdominal lesion.[1] A point of considerable diagnostic importance is the fact that the pain is often increased by coughing, sneezing, flexion of the neck on the chest or of the legs on the abdomen, pointing to root irritation. Some patients with epidural abscess cannot recline because of the severity of the pain and obtain partial relief on standing or sitting.[13]

Sooner or later neurologic signs or symptoms appear. In 73 reported cases of epidural abscess in which it was possible to analyze the interval between the onset of pain in the back and the development of neurologic signs or symptoms the interval varied from two to forty days, with an average of six and five-tenths days. In our case this interval was eighteen days.

The onset of neurologic symptoms may be sudden, without warning.[14] Thus the first indication of involvement of the cord may be acute retention of urine, anesthesia of the extremities or paraplegia, complete within a few minutes, suggesting acute interference with the blood supply of the cord.[6] In the majority of the reported cases, however, symptoms of involvement of the cord have been gradual in onset, as in our case, with slight stiffness of the neck, mild disturbances of the bladder and paresthesia or weakness of the extremities. These symptoms, once they have developed, increase so that paraplegia, usually of the flaccid type, is complete within a few days after the onset of neurologic symptoms. Sensory involvement is usually not as frequent or severe as motor involvement, although a sensory level is often present in cases of paraplegia, with anesthesia below the level of the lesion. Infrequently,[15] the sensory level may ascend or descend, depending on the migration of the pus in the epidural space.

12. Bellerose, A., and Amyot, Roma: Metastatic Epidural Abscess, Canad. M. A. J. **27**: 629, 1932. Pincoffs, M. C., and Gundry, Lewis: Epidural Abscess with Paraplegia, Internat. Clin. **3**: 49, 1936.

13. Stammers, F. A. R.: Spinal Epidural Suppuration with Special Reference to Osteomyelitis of the Vertebrae, Brit. J. Surg. **26**: 366, 1938.

14. Van Den Berg, W. J.: Acute Metastatic Spinal Epidural Abscess, California & West. Med. **46**: 257, 1937. Mixter, W. J., and Smithwick, R. H.: Acute Intraspinal Epidural Abscess, New England J. Med. **207**: 126, 1932. Stammers.[13]

15. Cathey, A. D.: Epidural Infections of the Spine, Tri-State M. J. **7**: 1484, 1935. May, W. N.: Staphylococcic Infection of the Epidural Space, Roy. Berkshire Hosp. Rep., 1932, p. 144. Van Den Berg.[14]

DIAGNOSIS

The extreme importance of making a diagnosis early, that is before the onset of paralysis or meningitis, may be judged from the fact that of 103 reported cases of acute spinal epidural abscess early diagnosis was made in only 5.[16] In 33 the condition was recognized for the first time at autopsy. In 1 the diagnosis was made after the development of meningitis,[17] which proved fatal despite operation. In 64 the diagnosis and operation were deferred until the onset of paralysis. Of the 64 patients 37 died, 12 recovered with residual paralysis and 15 recovered completely. The 5 who had an early diagnosis and operation all recovered completely. It is clear that the mortality is 100 per cent without operation and that successful operation depends on early diagnosis.

The relentless pain in the back accompanying an epidural abscess is of the greatest importance in diagnosis. The unusual severity and persistence of the pain should put one on guard, as suggested by Dandy,[2] for slight neurologic symptoms or signs. Judging from the reported cases, the earliest neurologic signs seem to be slight stiffness of the neck, a slight Kernig reflex and an aggravation of the pain in the back on flexion of the neck or thigh. The clinical diagnosis in our case was based on the development of an abnormal abdominal reflex.

A sign of value in early diagnosis is tenderness on percussion of the portion of the spine overlying the abscess. This sign is almost invariably present. In a few cases of a proved abscess,[9] as in our case, tenderness was limited largely or entirely to the costovertebral angle, leading to the incorrect diagnosis of perinephric abscess or cortical abscess of the kidney. In rare instances [18] spinal tenderness has been absent, so that this sign cannot be relied on constantly in diagnosis.

Local edema is apparently of little value in early diagnosis, since this sign has been reported in cases of late involvement associated with mediastinal or perinephric abscess or paraplegia.[19]

Despite clear clinical signs and symptoms, early diagnosis must depend on spinal puncture. We believe that a spinal puncture is indicated for every patient with acute infection presenting severe pain in the back and/or a radicular syndrome, with or without signs of involvement of the cord. A preoperative diagnosis may be made on finding pus in the epidural space or an abnormal spinal fluid.

The changes in the spinal fluid depend on the degree of subarachnoid block and the extent of involvement of the leptomeninges. The fluid has been variously described as clear, cloudy, hemorrhagic or purulent. The cells have been few or many. The fluid has been sterile or contained organisms. An increase in total protein, with or without dynamic block, is of vast importance in diagnosis, since this may be the only abnormal condition. When the block is further advanced the fluid may be xanthochromic and may coagulate on

16. Fitch, T. S. P.: Sulfathiazole in Staphylococcus Aureus Epidural Abscess with Septicemia and Pyemia, Arch. Pediat. **57**: 119, 1940. Slaughter, F. B.; Fremont-Smith, Frank, and Munro, Donald: Metastatic Spinal Epidural Abscess, J. A. M. A. **102**: 1468 (May 5) 1934. Stanley, Dean: Acute Metastatic Spinal Epidural Abscess, Illinois M. J. **68**: 515, 1935. Cohen.[9] Van Den Berg.[14]

17. Gasul, B. M., and Jaffé, R. H.: Acute Epidural Spinal Abscess, Arch. Pediat. **52**: 361, 1935.

18. Abrahamson, Leonard; McConnell, A. A., and Willon, G. R.: Acute Epidural Spinal Abscess, Brit. M. J. **1**: 1114, 1934. Wei, Y. L.: Acute Spinal Pachymeningitis Externa, China M. J. **42**: 654, 1928. Spencer.[5]

19. Bunch, G. H., and Madden, Emmett: Acute Extradural Abscess with Compression of the Cord, Am. J. Surg. **20**: 763, 1933. Christenson, F. C.: An Unusual Case of Spinal Abscess, Wisconsin M. J. **22**: 472, 1924. Stammers.[13] May.[15]

standing, and there may be little or no response to compression of the jugular vein. To determine block it may be necessary to repeat the spinal tap over several days or to perform a combined cisternal and lumbar tap and compare the protein content of the spinal fluid.

The presence of pus in the epidural space is pathognomonic of spinal epidural abscess. An absence of pus on lumbar tap, however, does not rule out a lesion at a higher level of the cord. When the spinal fluid is abnormal but no pus is found, the level of the lesion may be determined by careful neurologic examination. In the absence of localizing signs, however, the lesion may be located by carefully tapping the spine at the level of maximum spinal tenderness or by the introduction of iodized oil into the subarachnoid space.[20] In performing the spinal tap great caution must be observed to prevent contamination of the spinal fluid with epidural pus.[21]

The roentgenogram is of no value in the early diagnosis of spinal epidural abscess. Acute osteomyelitis of the spine, if present, is frequently not demonstrable by roentgenogram.[22] Of 20 reported cases in which roentgenograms were made preoperatively, evidence of osteomyelitis was present in 1; it was absent in the others, although these were all cases of late spinal involvement associated with paraplegia. Shadows of soft tissue in front of or to the side of the spine, indicating prevertebral [9] and paravertebral [23] abscess, have been recognized in roentgenograms but always in cases of late involvement with complications.

DIFFERENTIAL DIAGNOSIS

A review of the literature reveals that acute spinal epidural abscess has been frequently confused with a number of medical and neurologic conditions. The more important of these are acute anterior poliomyelitis, acute myelitis, epidemic meningitis, perinephric abscess or cortical abscess of the kidney and tumor of the spinal cord.

1. *Acute Anterior Poliomyelitis.*—Pain in the back is not uncommon with acute anterior poliomyelitis. This symptom in association with weakness of the extremities and abnormality of the spinal fluid may cause difficulty in diagnosis. Sensory changes, subarachnoid block or pus in the epidural space excludes poliomyelitis.

2. *Acute Myelitis.*—Paraplegia, anesthesia and paralysis of the sphincters may occur in acute myelitis, together with fever, pain in the back and in rare instances spinal block, so that the clinical picture may closely simulate that of acute spinal epidural abscess. Several features distinguish myelitis from epidural abscess. There is usually no history of suppuration or spinal trauma. The onset is likely to be with symptoms of a systemic infection rather than with pain in the back as in epidural abscess. Pain in the back in myelitis is usually mild and may be delayed until the onset of or follow the symptoms of involvement of the cord. Evidence of dissemination of the lesion may be obtained in cases of myelitis; involvement of the cranial or peripheral nerves may be present. Finally, spinal tenderness and epidural pus are absent in myelitis.

3. *Primary Suppurative Meningitis.* — Headache, fever, stiffness of the neck or back, positive Kernig or Brudzinski reflexes and a cloudy or purulent spinal fluid, with or without organisms, may occur in spinal meningitis or in spinal epidural abscess. The distinctive onset with pain in the back, spinal tenderness, paralysis, sensory involvement and subarachnoid block indicate an epidural abscess. A careful spinal tap with the stilet removed and frequent suction will differentiate pus outside the dura from pus in the subarachnoid space. A differential tap, a comparison of the cisternal and the lumbar spinal fluid, may be of further aid in diagnosis.

4. *Perinephric Abscess or Cortical Abscess of the Kidney.*—A history of suppuration, such as that in a furuncle, followed by lumbar pain, signs of acute infection and loin tenderness, with normal results of urinalysis, are common to carbuncle of the kidney and spinal epidural abscess. Neurologic signs or symptoms, however slight, are indicative of a spinal lesion. A spinal tap should always be done if there is any question of an epidural abscess. In unusual instances [13] of epidural abscess, pus may extend through the intervertebral foramens to the retroperitoneal space and produce swelling in the loin and obliteration of the margin of the psoas muscle on roentgen examination, leading to the incorrect diagnosis of a primary abscess of the psoas or a perinephric abscess. On the other hand, the infection may begin as a cortical abscess of the kidney or a perinephric abscess and involve the cord or epidural space secondarily.[24] Regardless of the origin of epidural abscess, laminectomy is indicated.

5. *Tumor of the Cord.*—Tumor of the spinal cord should offer no difficulties in differential diagnosis, since the acute onset of pain in the back and fever and the rapid progress of the lesion speak against tumor of the cord.

TREATMENT

The treatment is immediate surgical intervention. Laminectomy with complete drainage of the epidural space must be carried out.

SUMMARY

Acute spinal epidural abscess is a definite clinical entity that demands early diagnosis and operation to prevent paralysis or death. The diagnosis is easy to make if the following sequence of events is considered: (1) a history of preexisting infection or spinal trauma; (2) a latent period between this and the time of onset of pain; (3) the development of severe pain in the back, signs of acute infection and spinal tenderness; (4) a latent period between the pain in the back and the onset of neurologic signs and symptoms, and (5) the development of symptoms and signs of involvement of the cord or meninges leading to paralysis or meningitis.

The identical signs and symptoms may accompany a variety of lesions of the cord, but this sequence is indicative of spinal epidural abscess. A definite diagnosis may be made on finding pus in the epidural space or abnormal spinal fluid in a patient presenting the characteristic clinical picture.

3459 Fifth Avenue.

20. Bennett, A. E., and Keegan, J. J.: Circumscribed Suppuration of Spinal Cord and Meninges, Arch. Neurol. & Psychiat. **19**: 329 (Feb.) 1928. Abrahamson, McConnell and Willon.[18]

21. Rosamond, Eugene: Epidural Abscess Complicated by Staphylococcus Meningitis, J. Pediat. **1**: 230, 1932. Cohen.[9] Mixter and Smithwick.[14]

22. Klein, H. M.: Acute Osteomyelitis of the Vertebrae, Arch. Surg. **26**: 168 (Feb.) 1933.

23. Brill, N. Q., and Silverman, D. E.: Pyogenic Osteomyelitis of the Spine, Mediastinal Abscess and Compression of the Cord, J. A. M. A. **110**: 2001 (June 11) 1938.

24. Abeshouse, B. S., and Bogorad, D. E.: Perinephritic Abscess and Diseases of the Vertebrae and Spinal Cord, Urol. & Cutan. Rev. **39**: 295, 1935.

Clinical Notes, Suggestions and New Instruments

BILATERAL THROMBOSIS OF ANTERIOR CEREBRAL ARTERY FOLLOWING STIMULATION OF A HYPERACTIVE CAROTID SINUS

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NEW YORK

Stimulation of the carotid sinus, because of its importance in the differential diagnosis of neurologic diseases, has become routine in the complete neurologic examination. The syncope, convulsive seizure, asystole or fall in blood pressure which is produced may frequently be alarming, but there are no reports in the literature of any untoward results following stimulation of a hypersensitive carotid sinus. The present report deals with a case in which, immediately after induction of carotid sinus syncope, a progressive thrombosis of both anterior cerebral arteries developed, which ended fatally.

REPORT OF CASE

A railroad brakeman aged 53 was seen in neuropsychiatric consultation because of a complaint of emotional instability and mental depression for over two years. He had always been irritable. He had had typhoid in 1902, amebic dysentery, treated with emetine, in 1938 and a severe respiratory infection in September 1940 which had left him with a cough. The general physical examination revealed no significant abnormalities except for peripheral and retinal arteriosclerosis. The blood pressure was 130 systolic and 75 diastolic. Fluoroscopy of the chest, heart and gastrointestinal tract revealed no pathologic conditions. The electrocardiogram, basal metabolic rate and sedimentation rate were normal and the Kahn test and gastric and urine analysis were negative. The hemoglobin content was 114 per cent, the red blood cell count 6,100,000 and the leukocyte count 14,000, with a normal differential. The hematocrit test was within normal limits.

Neurologic examination was negative except for generally depressed deep reflexes and lack of flexion of the right big toe on plantar stimulation. The carotid sinus reflex was then tested. Compression of the left carotid sinus for thirty seconds produced no abnormal reactions. Compression of the right carotid sinus caused a definite immediate slowing of the pulse, followed in a few seconds by generalized clonic twitchings and syncope. The latter lasted about ten to fifteen seconds, after which the patient apparently recovered completely and laughingly said "I guess I must have fainted." The psychiatric examination was then begun. It had not proceeded more than a few minutes when the patient suddenly became unresponsive, developed a fixed, uncomprehending stare, slowly pitched over to the left and became incontinent of urine. He was completely aphasic and apraxic (the patient was right handed). Forced grasping of the right hand and bilateral groping movements were noted. The right leg did not move on stimulation with a pin, and a definite Babinski reflex appeared on the right side.

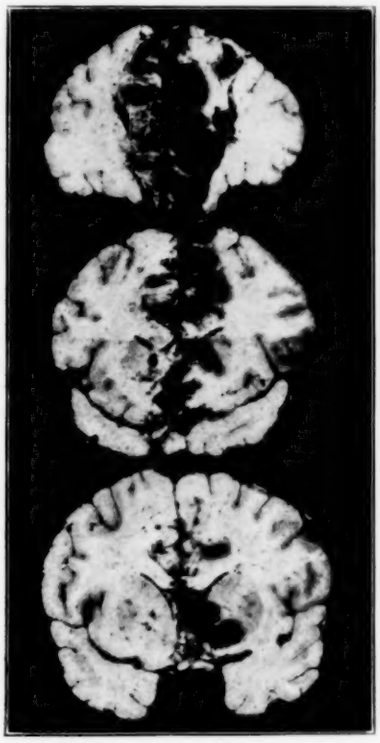
A clinical diagnosis of probable thrombosis of the left anterior cerebral artery was made, and the patient was immediately hospitalized. Within a few hours after the onset there was beginning spasticity of the right arm and leg. All the deep reflexes became hyperactive (more on the right) and the abdominal reflexes could not be elicited. There was no paralysis at that time, but the right arm and leg were apparently weaker than the left. The patient reacted to pinprick all over his body. A grasp reflex developed in the left hand also, and sucking and chewing reflexes were easily elicited. He apparently understood simple directions but had a complete motor aphasia and apraxia. There was no facial weakness. Difficulties in respiration with cyanosis developed. The lungs were clear, however, and roentgen examination of the chest was negative. The blood pressure was 142 systolic and 90 diastolic.

From the Neurological Service of Dr. I. S. Wechsler, Mount Sinai Hospital.

The spasticity rapidly became more severe, and within six hours the right arm was in rigid flexion and could not be extended. The right leg was extended at all the joints and the left leg was now also involved, but to a lesser degree. Least involved was the left arm. A Babinski reflex now appeared on the left also. The following morning, about twenty hours after the onset, the patient lapsed into stupor and Cheyne-Stokes respirations developed. The spasticity became more severe and the right arm could not be moved. The eyes were not deviated at any time.

A lumbar puncture, the day after the onset, had an initial pressure of 300 mm. of water, normal dynamics and a final pressure (after removal of 10 cc.) of 130 mm. The fluid was faintly xanthochromic, contained 2,000 red blood cells and a total protein of 81 mg. A blood count revealed leukocytosis (15,200 cells) with 83 per cent polymorphonuclears. Urinalysis and blood chemistry studies were negative. Electroencephalography two days after the onset revealed diffuse delta activity of various frequencies with much one and one-half second activity of from 50 to 100 microvolts.

The temperature continued to rise, the breathing became more dyspneic and the stupor deepened. The right pupil became dilated, the left constricted and both were fixed to light. Flaccidity became generalized three days after onset (with deep coma) but the right arm was the last to lose its spasticity. The fundi never showed evidence of papilledema. The patient died, four days after the onset, with respiratory distress and a temperature of 105 F.



Serial sections of brain, illustrating the hemorrhagic areas on the medial aspect of both frontal lobes. On the right side, where the lesion is more extensive, it extends to the medial aspect of the basal ganglions.

Postmortem examination revealed coronary sclerosis and myocardial fibrosis, acute congestion of all the viscera, bronchopneumonia with pulmonary edema, adrenal rest in the left kidney and cystitis granulosis. The brain was diffusely swollen at autopsy. The gyri were wide and flattened and the sulci were narrowed. There was definite softening of both frontal poles, most pronounced on the orbital surface of the right frontal lobe, where there were several small hemorrhagic areas. There was yellowish discoloration of the cortex at both frontal poles, most noticeable on the orbital surfaces and on the convexity of the cerebral hemispheres in the superior frontal convolutions. The vessels of the circle of Willis were moderately thickened, and in the region of the anterior cerebral arteries (more on the right) and the anterior communicating artery there was apparent thrombus formation. Sections of these vessels revealed recent thrombus formation, most pronounced along an area of thickened and hyperplastic intima.

Sections of the brain revealed large hemorrhagic areas on the medial aspect of both frontal lobes (along the distribution of the anterior cerebral arteries). This was more noticeable on the right side, where the hemorrhagic area extended posteriorly and laterally to involve the medial portion of the corpus striatum. There were other smaller areas of hemorrhage scattered in the substance of the cerebral hemispheres.

CONCLUSIONS

A man aged 53 had bilateral thromboses of the anterior cerebral arteries a few minutes after stimulation of a hypersensitive carotid sinus. While it is possible that the patient would sooner or later have had an ictus spontaneously, it is nevertheless felt that the slowing of the pulse and the fall in blood pressure produced by stimulation of the carotid sinus was a contributory factor in prematurely precipitating the cerebral thrombosis.

It is well known that the syndrome of the hypersensitive carotid sinus is most frequently observed in elderly persons with evidence of advanced arteriosclerosis, cerebral as well as myocardial. It may well be that carotid sinus stimulation is not entirely without danger in such persons. It would seem advisable that in all patients with evidences of advanced cerebral arteriosclerosis, stimulation of the carotid sinus should be performed cautiously and should be interrupted at the first evidence of hypersensitivity without continuing to the point of actual syncope.

CARCINOMA OF THE LUNG

A TEN YEAR SURVEY OF NECROPSIES IN THE CHARITY HOSPITAL AT NEW ORLEANS

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A survey of the necropsy material of the Charity Hospital at New Orleans for the past decade reveals a relative and absolute increase of carcinoma of the lung. This is in accord with the reports of others.[1]

During the decade ending Dec. 31, 1940, a total of 12,972 necropsies were performed, 8,862 of which were on persons over 1 year old. Among the subjects there were 135 with carcinoma of the lung, 205 with carcinoma of the stomach and 66 each with carcinoma of the biliary system and of the pancreas. Carcinoma of the lung was therefore more than one half as frequent as carcinoma of the stomach and more frequent than carcinoma of the biliary system and carcinoma of the pancreas together. The year by year analysis shows that while in number of cases carcinoma of the stomach remained about the same, that of the lung increased gradually and during the past two years exceeded carcinoma of the stomach (table 1).

Race, Sex and Age Incidence.—Of the 8,862 necropsies 3,838 were performed on white and 5,024 on Negro subjects, a proportion of approximately 4:5 (table 2). Carcinoma of the lung, however, occurred 81 times among the white and 54 times among the Negro subjects, a proportion of 1.5:1.

In the total necropsy material there were 5,635 males (2,610 white and 3,025 Negro) and 3,227 females (1,228 white and 1,999 Negro), a proportion of almost 2:1. Carcinoma of the lung, however, occurred in 123 men (73 white and 50 Negro) and in 12 women (8 white and 4 Negro), a proportion of about 10:1.

TABLE 1.—*Regional Distribution of Carcinoma, Charity Hospital of Louisiana at New Orleans, 1931 to 1940*

	Necropsies on Persons Over 1 Year Old	Lung	Stomach	Biliary System	Pancreas
1931	628	3	15	7	1
1932	772	9	22	2	9
1933	996	9	19	10	8
1934	909	11	22	5	7
1935	921	7	22	4	5
1936	1,072	13	19	4	9
1937	837	13	21	9	2
1938	828	16	19	11	4
1939	967	24	22	7	8
1940	932	30	24	7	13
Total	8,862	135	205	66	66

The youngest patient was 21 and the oldest 75. Two died in the third, 7 in the fourth, 24 in the fifth, 56 in the sixth, 39 in the seventh and 7 in the eighth decade of life. More than 80 per cent of the patients were thus in the sixth decade of life or older.

TABLE 2.—*Distribution of Carcinoma of the Lung*

	Men		Women		
	White	Negro	White	Negro	Total
Squamous cell	38	30	5	1	74
Reserve cell	23	15	0	1	39
Columnar cell	12	5	3	2	22
Carcinoma of lung	73	50	8	4	135
Necropsies	2,610	3,025	1,228	1,999	8,862

Cellular Structure.—Among the 135 carcinomas of the lung, 74, more than 50 per cent, were squamous cell; 39, approximately 30 per cent, were reserve cell, and 22, less than 20 per cent, were columnar cell carcinomas.

SUMMARY AND CONCLUSION

A survey of the necropsy material of the Charity Hospital at New Orleans disclosed that during the past decade carcinoma of the lung was discovered in 135 of 8,862 necropsies on persons over 1 year old.

A comparison with the number of carcinomas of the stomach, of the biliary system and of the pancreas in the same series suggests that carcinoma of the lung is becoming the second, if not the first, most common malignant neoplasm in the male.

From the Departments of Pathology and Bacteriology of the Louisiana State University School of Medicine and the Charity Hospital.

1. Rosahn, Paul D.: Incidence of Primary Carcinoma of the Lung, Arch. Path. **29:** 649-664 (May) 1940. Ochsner, Alton, and DeBakey, Michael: Carcinoma of the Lung, Arch. Surg. **42:** 209-258 (Feb.) 1941. Menne, Frank R., and Anderson, Melvin W.: Bronchiogenic Carcinoma: Its Incidence in the Pacific Northwest, Together with a Commentary on Eighty-Four Instances, in preparation.

DEPENDENCE OF THE COLD PRESSOR REACTION ON PERIPHERAL SENSATION

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Hines and Brown [1] in 1932 introduced the local application of cold stimuli as a procedure for the quantitative estimation of the reactivity of the vasomotor system. They were seeking a standard stimulus to increase the blood pressure. The cold pressor test has since been extensively used.[2]

These investigators [1] describe the changes which occur when the hand is immersed in ice water: "The systolic and diastolic blood pressures immediately rise, and return to the basal in from one to two minutes. Similar results are obtained by placing a foot in cold water, but there is no augmented response by placing both hands or both feet, or all four extremities, in ice water. We assumed that the basis of this reaction is the sudden stimulation of the cutaneous nerves of temperature and pain. The response is too rapid to be the result of hormonal and chemical influences."

To prove this theory Ayman and Goldshine suggested that the test should be carried out on an extremity completely devoid of sensation to cold and pain such as is found in syringomyelia. A patient with an equally suitable condition was recently admitted to the neuropsychiatric service of the Albany Hospital.

P. M., a white man aged 35, had a transection syndrome fourteen years ago after being struck in the back by a falling beam. Because of pain, a laminectomy was performed one year after the accident. At operation, the spinal cord below the first lumbar segment and all intradural nerve roots at this level were removed. Since that time the patient has been completely paralyzed from the hips down, and there has been complete anesthesia to all forms of sensation below approxi-

From the Department of Neurology and Psychiatry of the Albany Hospital and Albany Medical College.

1. Hines, E. A., and Brown, G. E.: A Standard Stimulus for Measuring Vasomotor Reactions, Proc. Staff Meet., Mayo Clin. **7:** 322-335 (June 8) 1932.

2. Ayman, David, and Goldshine, A. D.: Cold as a Standard Stimulus of Blood Pressure, New England J. Med. **219:** 650-655 (Oct. 27) 1938. Miller, J. H., and Bruger, Maurice: Cold Pressor Reactions in Normal and Primary Essential Hypertension, Am. Heart J. **18:** 329-333 (Sept.) 1939

mately the first lumbar dermatome. Spontaneous paresthetic pain has occurred in paroxysms since the injury under the dermatomes innervated by the first lumbar segment on the left and the first and second on the right. The circulation in the legs has remained unimpaired.

The immersion of this patient's hand into ice water induced a constant rise in systolic and diastolic blood pressures; thus in one instance from 120 to 140 systolic and from 90 to 104 diastolic. There was an accompanying increase in the pulse rate from 80 to 110 a minute. When the foot was immersed no constant change in these indexes was noted. Occasionally a slight systolic rise of less than 10 mm. of mercury could be observed, but most often there was no change. Acceleration of the pulse rate or increase of the diastolic pressure was not effected by immersion of the foot in cold water.

SUMMARY AND CONCLUSION

It has been assumed that the basis of the cold pressor reaction is the sudden stimulation of the cutaneous nerves of temperature and pain.

Studies on the upper and lower extremities of a patient with a transection syndrome tend to substantiate this assumption.

New Scotland Avenue.

Special Article

SYPHILOTHERAPY: RECENT ADVANCES

GENERAL SCIENTIFIC LECTURE AT CLEVELAND SESSION

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Every physician devoting his life work to a specialized line of endeavor is bound to have more or less correspondence with various colleagues and lay persons in regard to problems arising along that line.

It is not often, however, that the same specialist goes to the trouble of collecting and analyzing this correspondence.

This has recently been done by Stokes and Ingraham [1] in two related publications, the one that is of particular interest here being entitled "Two Thousand Questions the Doctor Asks About Syphilis." In the period from July 1928 to July 1938 nine hundred and fifty-five letters have been answered either by them or in the Queries and Minor Notes of THE JOURNAL. In the case of the latter, they have been answered anonymously by various correspondents. The total number of questions answered by Stokes and by the correspondents was 2,115. Statistical break down of the 2,115 inquiries revealed some forty-eight categories or types. Eighty-seven and five-tenths per cent of the questions (1,844) came from physicians and around 50 per cent of the inquiries were covered by six main headings—though they did not by any means comprise all the most important subjects.

These two articles I have read with much interest, and I believe that, to a certain extent, they indicate problems arising in the mind of the practitioner. Possibly they might serve in part as a guide to the subject to be discussed: "Syphilotherapy: Recent Advances." Some of the subjects are not pertinent to this discussion.

There were 295 questions, or 14 per cent of the whole, devoted to a subject most important to the physician and to his patient—treatment schedules for individuals. The largest number of the questions were in regard to handling cases of late latent syphilis and neurosyphilis, next most frequently, congenital syphilis, early and late, and ill defined types of syphilis for which satisfactory answers were difficult. Following these came early latent syphilis, cardiovascular types and secondary syphilis, and then some minor items. Stokes very justly pointed out the difficulty of making out a treatment schedule for late syphilis, particularly of neurovascular, cardiovascular and visceral types. The case is one unto itself and must be individualized depending on the observations made. I would agree with this and to offer an example: Broadly one may say that some form of fever therapy is indicated in most cases of syphilis of the central nervous system; however, a person with a beginning dementia paralytica but complicated by a large aneurysm of the aorta would hardly come within the foregoing accepted indication. Many of the late manifestations of syphilis will have to be gone over carefully, and the treatment will of necessity be for that case alone. On the other hand, in early latent, in primary and in secondary syphilis it will be much easier to make out a schedule which within reason will apply to most patients.

The next most frequent category of questions, 11.25 per cent of the whole, was on drugs. It comprised 238 inquiries. There were twenty-nine items on arsenicals, twenty-seven on bismuth and nine on mercury. There were inquiries about water soluble and oil suspended preparations and about bismuth content. The questions on arsenicals included relative merits of arsphenamine and neoarsphenamine and of preparations to be used intramuscularly, sulfarsphenamine and bismarsen. Questions were also asked on the technic of intramuscular injections, on intraspinal therapy and on spinal drainage. Queries were made on effects of iodides and on particular brands of neoarsphenamine.

The following four groups of questions were not pertinent to this paper: comprising "serologic tests," 9.25 per cent of the whole; "treatment reactions," 5.5 per cent of the whole; "cases the doctor wishes diagnosed," 5 per cent of the whole, and "cases for differential diagnosis," 5 per cent of the whole.

In one of the most important problems in public health—the control of infectiousness—the physician has not been particularly interested. At least the questions amounted to only 3.5 per cent and was relegated to seventh place in prominence.

Only 2.5 per cent of the questions were in regard to the question of syphilis and pregnancy—one of the really great problems in prophylaxis of congenital syphilis. Such questions were asked as "Shall we do an abortion?" "Shall the mother be treated at all?" "What are the child's chances?" and "Is bismuth alone sufficient prenatal treatment?" As Stokes puts it, "Such inquiries are evidence of abysmal ignorance of modern knowledge of a most important preventive field." This is indeed putting it mildly and will be discussed further in the paper.

Questions on fever therapy, on spinal fluid, on treatment of syphilis complicated by other factors, on prog-

Read in the General Scientific Meetings at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 2, 1941.

From the Department of Dermatology and Syphilology of the Western Reserve University School of Medicine and of the University and Cleveland City Hospitals.

1. Stokes, J. H.; Ingraham, Norman R., and Stannard, E. H.: A Study of Consultation by Correspondence in Syphilis, Ven. Dis. Inform. **21**: 129-147 (May) 1940; Two Thousand Questions the Doctor Asks About Syphilis, ibid. **21**: 147-156 (May) 1940.

nosis of certain cases and on whether syphilis should ever be treated all came in groups of around 2.5 per cent to 2 per cent of the whole.

SYPHILIS AND PREGNANCY, AND CONGENITAL SYPHILIS

On the other hand, the treatment of congenital syphilis rated only seventeenth in the number of questions asked. Does the physician feel that he already knows all there is to be known on the subject? It was Stokes' opinion that "the whole subject of syphilis in pregnancy and congenital syphilis deserves further broadcasting and instruction to the profession." To this I heartily agree. In answer to one query—No! Syphilis is not transmitted from father to the fetus. The fetus can be infected only through transmission of the Treponema pallidum from the mother's blood through the placenta to the fetal circulation. Again, an abortion should never be done because of syphilis in the mother; rather, she should be given treatment. This should be instituted at the earliest possible moment. The earlier the diagnosis the better, and to that end the physician should take a serologic check on every prospective mother at the first visit, again at the fifth month and at the seventh month. This repetition is necessary to detect infection taking place later in pregnancy. Around 1,000,000 potential mothers in the United States have syphilis [2] and each year these women transfer the disease to at least 85,000 fetuses, 25,000 dying before birth and 60,000 being born alive with syphilis. Only about one fifth of the pregnant women seek medical care before the fifth month, at the time most favorable for the diagnosis and treatment of congenital syphilis. Treatment should not be confined to bismuth preparations alone but to arsenic as well, most emphasis being placed on the arsenicals. It has been shown repeatedly that when treatment is begun before the fifth month of pregnancy—the earlier the better—practically all children will be born alive and a large percentage free from congenital syphilis; that is, provided the treatment is of the continuous type, that it is started with weekly intravenous injections of an arsenical in moderate dosage, followed immediately by a short series of intramuscular injections of bismuth subsalicylate, and that it is ended up by further arsenicals administered weekly up to the birth of the child. Even if the treatment is started late in pregnancy, in which case concomitant injections of arsenicals and of bismuth are in order, there is an excellent chance of getting a viable child rather than a dead one. The child may then itself be treated for the disease. It is not necessary to treat a pregnant congenital syphilitic woman unless it is suspected that she has contracted an acquired syphilis on top of the congenital disease. Third generation syphilis is almost unheard of.

When the diagnosis of early congenital syphilis has been made on a child, therapy [2] should be started either by mercury with chalk 0.015 Gm. to 0.03 Gm. (¼ to ½ grain) three times a day for a week or so or by intramuscular injections of bismuth subsalicylate 0.001 Gm. per kilogram weekly for three weeks. The newborn babe with congenital syphilis cannot withstand the shock of severe treatment. This may then be followed with intramuscular injections weekly of sulfarsphenamine 0.005 Gm. per kilogram gradually raised to 0.01 Gm. per kilogram for a series of ten injections. Thereafter the treatment should consist of alternating continuous courses of ten intramuscular injections each of sulfarsphenamine gradually raised to a maximum of 0.015 Gm. per kilogram and of bismuth subsalicylate raised to a maximum of 0.002 Gm. per kilogram until the child has received from forty to fifty of each. Smith [3] has found that with infants under 6 months of age there will be more than 80 per cent cures if the patients receive fifty injections of these drugs before the age of 2 years. Moreover, such treatment is an excellent prophylaxis of the devastating later crippling ravages of congenital syphilis—involvement of the eighth nerve, involvement of the central nervous system, osseous involvement and interstitial keratitis. The best present known treatment for interstitial keratitis is the use of fever therapy along with large doses of vitamin B_2 by mouth. Vitamin B_2 alone is not sufficient, but it does seem to be of some value. The fever therapy best serving the purpose is either malaria or the hypertherm, the patient being given from eight to ten bouts of fever. In fact, in these cases the hypertherm may be preferable, as the treatments may then be given as desired, e. g. twice or three times a week. Antisyphilitic therapy and potassium iodide should not be used in cases of interstitial keratitis. Later the arsenicals and bismuth may be employed, as in cases of acquired syphilis, in alternating courses of the drugs given in a continuous fashion.

DRUGS USED IN THE TREATMENT OF EARLY SYPHILIS

Another category of questions on drugs deserves an answer. It has been my feeling, many times reiterated, that the physician would do well to know a few antisyphilitic drugs and to know them well rather than to be all mixed up and confused with this and that water soluble bismuth, liposoluble bismuth and oil suspension of bismuth. For example, the occasion will be rare indeed when the physician will be required to use more than an accepted 10 per cent oil suspension of bismuth subsalicylate. It may be given intramuscularly once a week in alternate buttocks in courses of ten to twelve injections—dosage from 1 to 2 cc. for the adult. However, the physician should clearly differentiate such a compound from the various water soluble preparations on the market which must be given two or three times a week if a sufficient bismuth level in the blood stream is to be achieved. The patient getting a single weekly injection of a water soluble bismuth salt is being undertreated and is in danger of a relapse of the syphilis.

For arsenicals, there is a variety of acceptable compounds. It has been shown that there is little variance in the therapeutic value of the various accepted neoarsphenamines. Undoubtedly arsphenamine is the most potent; it is also the most difficult to prepare. On that account the average physician will prefer to use either neoarsphenamine or mapharsen—the dosage of the former being from 0.3 to 0.75 Gm. and of the latter from 0.03 to 0.06 Gm. Reactions with the latter are far less frequent and thus many prefer mapharsen. Mapharsen should be thoroughly aerated and mixed with water and should be rapidly injected—in contradistinction to neoarsphenamine. The injections of mapharsen may be given every five days for a course of twelve treatments. The situation occasionally arises in which intra-

2. Cole, H. N.; Jeans, Phillip C.; Moore, J. E.; O'Leary, Paul A.; Parran, Thomas; Stokes, J. H., and Vonderlehr, R. A.: Syphilis in Mother and Child, Ven. Dis. Inform. (supp. 7) pp. 1-20, 1940.

3. Smith, F. R., Jr.: Congenital Syphilis: Results of Treatment in Children, J. A. M. A. **105**: 409-411 (Aug. 10) 1935.

muscular injections may be necessary, and in such a situation sulfarsphenamine is the drug of choice. It should be gently dissolved in 1 to at most 2 cc. of distilled sterile water and is injected in alternate buttocks once a week for a course of ten treatments. This preparation is used freely in the New York State syphilis clinics and has given excellent results in cases in which an intramuscular compound is necessary. It is the drug of choice in cases of early congenital syphilis, in which it is used in slowly ascending doses from 0.005 up to 0.015 Gm. per kilogram.

LONG TERM MANAGEMENT OF EARLY SYPHILIS

There remains for consideration a treatment schedule applicable to the average case of early syphilis. By far the largest proportion of inquiries were relevant to this subject.

The physician encountering a case of early syphilis must keep several factors in mind.

True, the public health aspect comes first and should be properly satisfied. Sources and contacts should all be carefully checked for a sufficient time to assure the physician that there is no danger of further spread.

This discussion, however, is devoted more to the therapeutic management of the freshly infected syphilitic patient, newer aspects of this therapeusis on the final outcome of the disease being kept in mind. For example, there is much talk today of a five day intravenous drip treatment for acute syphilis. Such a plan would obviate any danger of lapse of treatment by the patient. It would be all over in probably seven to ten days of hospitalization. Every one freely admits that this very lapse of treatment is one of the weak points of the present management of the disease. Even in the best conducted clinics and offices, even with the best social service follow-up, many of the patients will never finish their course of treatment and consequently will never be cured and may be a menace to themselves and to every one with whom they come in contact. Consequently, if such a type of treatment were sure to cure the patient's disease and if it were within the bounds of reasonable safety to the person treated, it would be a great boon to medicine and to public health. Since, however, it is too new to be considered as more than in the experimental stage, it hardly comes within the scope of a talk intended to bring before the family practitioner approved and tried remedies.

Of course, the ideal treatment of acute syphilis and one to be aimed at would be such that the disease would be entirely eradicated through the use of a single dose of the suitable drug. Another necessary point would be that this drug should exercise no harmful effect on the host. Ehrlich and others thought that he had discovered it in arsphenamine (606). Moreover, those of us who used this preparation by the intramuscular route in the early days were profoundly impressed with its therapeutic effects as contrasted with those achieved by mercurial preparations. Unfortunately, some weeks to months later we began to encounter two things: first the relapse of the syphilis and, second, the fact that this intramuscular injection with its alkaline "p_H" frequently caused an enormous slough which was very slow in healing. In other words, two of the main requirements for the ideal remedy had failed and it was necessary to look further afield, either in the line of another remedy or in the perfection of the use of the preparation already at hand. Then the use of the drug intravenously was instituted, and multiple doses were employed. At first the arsenical was used along with its adjuvant mercury. Later bismuth salts were found to have a far higher spirocheticidal effect. Moreover, the injections were less painful, so that a further great step in the treatment of syphilis was instituted. Today, mercury is seldom employed unless there is a question of idiosyncrasy to either arsenic or bismuth.

In the past decade the Cooperative Clinical Group, under the auspices of the U. S. Public Health Service, has been bringing out a series of statistical studies on various phases of syphilis—particularly as related to its therapy.

These studies [4] early pointed out the necessity of a continuous type of treatment if best results were to be achieved. In other words, the patient's syphilis was to be treated with alternating courses of an arsenical and of a bismuth salt given in a continuous manner—in fact, even overlapping by having the first bismuth injection administered with the last arsenical in a course of treatment. This continuous form of treatment was found to be far superior to the intermittent form of treatment previously in vogue and unfortunately used all too much even today. In the intermittent method a purposeful rest period is instituted at the end of each course of treatment. Moreover, the continuous treatment was vastly superior in its effects to that form termed irregular in which the patient comes in when he feels like it. Finally, the poorest showing was made by the so-called intensive type of therapy in which three daily injections of an arsenical were followed by a course of injections of heavy metal and then a purposeful rest period—such courses with rest periods being kept up until it was deemed that the patient had received sufficient therapy for his disease.

It was further brought out by these studies that it was not only the type of therapy but also the amount that was very important. Those patients with early syphilis did best who had received twenty or more injections of an arsenical and of a bismuth compound given in a continuous manner. Probably today one would even be inclined to place that figure at from thirty to forty of each. Under these conditions there was observed a more rapid disappearance of the clinical symptoms of the disease, the serologic positivity of the blood reversed to negative and "staid put" and there was less evidence of progression and far fewer relapse symptoms noted.

Unfortunately, these statistical data were based mostly on material under observation and treatment for from six months to one year. It is true that some of it was of even longer duration. While it may sound trite, it is difficult to gather a large amount of long time data on the treatment of early syphilis, and yet this is just what is needed to give valid conclusions. Patients have a tendency to lapse treatment, to move out of town or to another address and get lost, to be unfitted for statistical studies because of reactions to treatment or even to die. Moreover, even after the treatment is finished a long post-treatment observation is necessary if the data are to be of value. For that reason a recent report by Padgett [5] from the

4. Stokes, J. H.; Usilton, Lida J.; Cole, H. N.; Moore, J. E.; O'Leary, Paul A.; Wile, Udo J.; Parran, Thomas, and McMullen, John: What Treatment in Early Syphilis Accomplishes, Ven. Dis. Inform. **15:** 341 (Nov.) 1934.

5. Padgett, Paul: Long Term Results in the Treatment of Early Syphilis, J. A. M. A. **116:** 7-11 (Jan. 4) 1941.

Johns Hopkins Clinic is like an oasis in the desert, since it has been possible for him to collect a fairly large group of treated syphilitic patients observed for a long period of time. Five hundred and fifty-one patients had been completely reexamined at least five years after the termination of two years of treatment. In fact, 273 had been followed for more than ten years. The mean of these followed from five to ten years was seven and six-tenths years and for the entire group ten and eight-tenths years.

Cure was defined as proved by reinfection or by absence of all signs and symptoms of syphilis after careful examination, including repeatedly negative serologic reactions and normal cerebrospinal fluid and cardiovascular conditions. Sixty-six per cent of these patients came up to these requirements, and a further 15 per cent were completely free of the disease except for a positive serologic reaction. Around 12 per cent of the patients had some form of neurosyphilis and another 7 per cent some form of other late manifestations.

One of the striking results of this study was that of a group of 273 patients examined at the ten year period 268 had been examined also at the five year period, and 179 were classified as cured. Strikingly enough, at the ten year examination none of these 179 had a relapse or progression of the disease. In fact 11 other patients diagnosed at the five year mark as having latent or late syphilis had gone on to cure at the ten year mark—three of them even without treatment. In other words, this careful survey establishes pretty well the important fact of the permanence of a five year cure in early syphilis. This is a valuable finding and interests every physician.

Among other points standing out in this study are the following:

In the group of patients not cured there was two and one-half times as much neurosyphilis among the whites as among the Negroes.

Cardiovascular syphilis, as usual, was more frequent among the Negro patients.

Pregnancy apparently exerts a beneficial effect on syphilis, as has been shown before.

The question now arises What group of syphilitic patients achieved the best results? The best outcome, 82 per cent of cures, was found in the group in which the diagnosis had been made early—in the seronegative primary phase of the disease. The poorest outcome was found in the group in which treatment was not started until the seropositive primary phase, as only 55 per cent of these patients were cured. Cures occurred in 69 per cent of patients with secondary syphilis when the patient had been able to build up some of his own immune powers and in 59 per cent of patients with latent syphilis. Neurosyphilis was two and one-half times as frequent among those patients on whom treatment was begun in the seropositive primary phase of the disease. As in other stages of syphilis, relapse played an important role here, for there were three times as many cures among those patients who did not have a relapse as among those who did. Moreover, neurosyphilis was encountered six times as often in the latter group. Relapses should be prevented in patients with early syphilis if possible.

What was the result as to system of treatment employed? Cures occurred in 83 per cent when continuous treatment, as contrasted to intermittent or irregular treatment, was employed in the first six months of the disease, and this was raised to 90 per cent if later treatment was also continuous. On the other hand, with irregular or intermittent treatment in the first six months, cures occurred in but 54 per cent, and this was not altered if the same plan was continued. Yet if the irregular treatment was changed to continuous in the second six months cures rose from 53 per cent to 73 per cent, while cures in the group given continuous treatment the first six months fell from 83 per cent to 75 per cent with irregular treatment the last six months.

Padgett also found that arsphenamine played a great role in the cure of syphilis, for "cure" rose from 35 per cent among 17 patients who never had any treatment to two thirds of those who received from ten to twelve injections, and lastly to 82 per cent among those who had more than twenty injections of arsphenamine. Moreover, the cure depended not only on the number of injections of the arsenical but inversely on the time span in which they were given. Those cases did better in which the arsenical was, within limits, given in a shorter period of time. In other words, in every suspected lesion on the genitalia, or other parts of the body for that matter, the physician should immediately institute repeated dark field examinations. One negative result does not rule out syphilis any more than one swallow makes a summer. If humanly possible, the diagnosis should be made by dark field examination rather than await a positive serologic reaction. It means all the difference between 82 per cent cures and 55 per cent cures, with the added two and one-half times as much neurosyphilis in the uncured seropositive primary group.

CONCLUSIONS

A safe, short cure for early syphilis is greatly needed. This would obviate lapses in treatment, infectious relapses and uncured syphilis. Until such a time as such a cure has been found and carefully checked, it is advisable to rely on slower but time tested and proved methods. This survey of Padgett's brings out several salient features.

1. If possible, the diagnosis in early syphilis should be made by the dark field examination; it must be remembered that one test does not rule out syphilis. If indicated, daily examinations are in order.

2. The outcome in early syphilis depends not only on the number of arsenical injections but also on the "time space" in which they are given.

3. The treatment in uncomplicated cases should run somewhat as follows:

Twelve injections of an arsenical.
Six weekly injections of bismuth subsalicylate.
Ten injections of an arsenical.
Eight injections of bismuth subsalicylate.
Ten injections of an arsenical.
Ten injections of bismuth subsalicylate.
Eight injections of an arsenical.
Twelve injections of bismuth subsalicylate.

4. The first three injections of the arsenical should be given three days apart, thereafter, with neoarsphenamine or arsphenamine, once a week, with mapharsen every five days. With the last arsenical

in a course the first injection of a bismuth compound should be given.

5. There will be 90 per cent plus cures if the diagnosis is made in the seronegative primary phase and if the treatment is of the continuous, overlapping type and consists of forty injections of an arsenical and of a bismuth compound.

1422 Euclid Avenue.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING CHAPTER, WHICH IS THE NINTH OF A SERIES ON AMPUTATIONS AND ARTIFICIAL LIMBS TO APPEAR IN THIS COLUMN. WHEN COMPLETED, THE SERIES WILL BE PUBLISHED IN THE FORM OF A HANDBOOK ON AMPUTATIONS. THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE COOPERATION OF ITS GROUP OF CONSULTANTS ON ARTIFICIAL LIMBS. THE COUNCIL IS REPRESENTED BY DRS. FRANK D. DICKSON, HARRY E. MOCK, FRANK R. OBER, S. PERRY ROGERS, PAUL STEELE AND PHILIP WILSON, AND THE ASSOCIATION OF LIMB MANUFACTURERS OF AMERICA IS REPRESENTED BY MESSRS. MCCARTHY HANGER SR., W. E. ISLE, JOSEPH A. SPIEVAK, DAVID E. STOLPE AND J. B. KORRADY.

HOWARD A. CARTER, Secretary.

CHAPTER IV. AMPUTATIONS IN DIABETES MELLITUS AND PERIPHERAL VASCULAR DISEASE

CLASSIFICATION OF PATIENTS

For practical purposes the conditions to be dealt with in this discussion may be grouped under three headings: (1) thromboangiitis obliterans, (2) arteriosclerosis without diabetes and (3) arteriosclerosis with diabetes. The principles involved in amputations in this entire group of patients vary somewhat from those involved in amputation in patients with normal peripheral circulation. Furthermore, the indications for operation and the problems involved in the care of patients with thromboangiitis obliterans are at such variance from those involved in the management of the group with arteriosclerotic gangrene that they must be considered separately.

The patient with arteriosclerotic gangrene with or without diabetes is usually 50 or more years of age, may be either male or female, will have other evidences of widespread arteriosclerosis, and in most instances will not be economically self supporting after the loss of a limb. The incidence of gangrene of the remaining foot is great.[1] Moreover, in the presence of diabetes the hazards of diabetic complications as well as the increased hazard of infection have resulted in a mortality following amputation which in the country at large varies from 13 to approximately 80 per cent.

Thromboangiitis obliterans, on the other hand, occurs in young men. Only rarely is it found in patients beyond 50 years of age, and it is most commonly seen in patients under 40. Women are practically exempt from the disease. Its etiology is unknown. It involves both veins and arteries. It usually begins in one lower extremity, may involve all four extremities, and not infrequently affects the coronary, cerebral, mesenteric or other vessels. The danger from infection in this group of patients is extremely slight. These men are in the wage earning age, and rehabilitation to a position of economic stability is of the greatest importance.

1. Forty in a group of 100 consecutive diabetic patients who had had amputation of one leg for gangrene developed gangrene of the other leg which resulted in amputation or death.

PREVENTION OF GANGRENE

While much can be done to prevent the actual onset of gangrene in all patients with peripheral arterial disease, a great deal more can be done for patients with thromboangiitis obliterans than for patients with arteriosclerosis. Extreme care in the hygiene of the feet is essential to all patients. Daily washing of the feet with soap and water, gentle wiping to avoid injury to the skin, paring of the nails only after a footsoak when the nails are softer rather than brittle, and avoidance of any injury to the cuticle; careful selection of new shoes to avoid pressure areas, proper treatment of corns and calluses (whenever possible by a trained chiropodist who understands the significance of diabetes or diminished circulation), and extreme care in avoiding anything which may cause a blister on the foot will do much to prevent the onset of gangrene in any of these patients.

The patient with thromboangiitis obliterans should be absolutely prohibited from smoking. Theoretically no patient with peripheral arterial disease should be allowed to smoke. Practically, the older patients with arteriosclerotic gangrene show so little vasoconstriction that in most instances what is gained by the cessation of smoking is not sufficient to warrant the hardship which this brings to many of these older patients.

To any patient with impending gangrene, excessive heat may be harmful. No patient with diabetes should ever be advised to apply heat to his foot. Many of these patients have disturbances of sensation, and burns of varying severity frequently result. Any burn on the foot of a diabetic patient is considered serious and may result in an amputation. It must also be remembered that the older patients with long-standing diabetes have difficulty with their eyes and are themselves not able to detect minor lesions on their feet. These patients should have their feet inspected regularly by some responsible member of the family.

ANESTHESIA

From 50 to 75 mg. of procaine hydrochloride injected into the spinal canal in the third or fourth lumbar space has proved an excellent form of anesthesia for the group of patients with arteriosclerotic gangrene with or without diabetes. The level of anesthesia can and should be kept below the level of the iliac crest. There is relatively little effect on the blood pressure if the anesthesia goes no higher than this. There will be complete muscular relaxation, and operation can be done with a minimum of trauma. Chloroform or avertin with amylene hydrate is too dangerous for these patients, and it is probably easier to learn to give a safe low spinal than a safe inhalation anesthesia of any of the gases. Ether should not be used for amputation on a patient with diabetes mellitus.

PRINCIPLES OF AMPUTATION

The technical principles involved in amputation for peripheral arterial disease are the same in all groups and, as already stated, may be at variance to those which obtain among patients whose circulation is adequate and who do not have diabetes. Early, complete and permanent healing takes precedence over the location of the scar and other details which result in the ideal

stump. Experience has shown that adherence to the following principles will give the best results, both immediate and remote. It will be noted that these principles are based primarily on two objectives: (1) preservation of the arterial supply and (2) avoidance of infection. They may be enumerated as follows:

1. Amputation must be done at a level which has adequate blood supply to insure healing. The arterial flow may be through collateral rather than main channels.

2. A circular incision is used except in the Gritti-Stokes amputation, which requires a longer anterior flap.

3. A tourniquet is never used except in a guillotine amputation.

4. While the field of operation should be carefully prepared as for any surgical procedure, the level of preparation should never approximate the involved area, and under no conditions should it extend more than 2 inches below the level of the proposed incision.

5. Great care should be taken in the manipulation of tissues. Incisions should be clean and decisive. A sponge or an instrument which has touched the skin should never be allowed to touch the inside of the wound. A sponge is used once and discarded. If the proper operation has been selected and the operation has been done at the proper time, any infection of the wound will come by contamination from the skin and be secondary to the manipulation of operation.

6. Sutures should be as fine as is consistent with the responsibility placed on them. No. 1 chromic catgut is desirable for the major vessels. No. 3 silk or 000 catgut may be used for the smaller vessels in the muscle and subcutaneous tissues. No. 5 silk or 00 chromic catgut may be used for the fascia. Heavier sutures than these are not necessary and may be injurious. For the surgeon not accustomed to silk technic, catgut is strongly advised.

7. Careful closure is of utmost importance. A few sutures are taken in the muscle; the fascia is closed with the same care as is used in the closure of an abdominal wound. There should be no dead space. The fascial edges should be approximated without undue tension. If the operation has been properly executed there will be no collection of serum. There is therefore no indication for drainage. A drain will merely act as a foreign body, invite infection and occasionally result in the loss of a stump. Carefully placed interrupted silk sutures are used for the skin. The skin edges should be carefully everted so that healing by first intention may result.

The nerves and blood vessels are clamped separately. It is not necessary to separate the artery from the vein, even in the larger vessels such as the popliteal. We prefer to crush, tie and cauterize the end of the nerve rather than to inject alcohol, particularly in a lower leg or Gritti-Stokes amputation, because of the necrosis that may follow the spilling of a small amount of alcohol in the more superficial structures.

INDICATIONS FOR MAJOR AMPUTATION

For the man who does only an occasional amputation for arteriosclerotic gangrene with or without diabetes, one of two amputations is advised: either (1) a guillotine amputation, usually below the knee, or (2) a closed supracondylar amputation. For the surgeon whose experience justifies the selection of a more complicated operation, closed amputation through the lower leg or a Gritti-Stokes amputation may be indicated.

Guillotine Amputation.—This is indicated for those patients for whom a primary closed amputation would in the judgment of the operator be hazardous. Obviously, the specific indications will vary somewhat with the experience of the surgeon. It should be done (1) for all patients with a septicemia secondary to a gangrenous foot, (2) for extending infection in spite of the usual treatment with moist heat and chemotherapy, (3) in the presence of extensive sepsis extending so high as to make a closed amputation unsafe, (4) for a seriously ill or markedly debilitated patient with extensive local sepsis when it is advisable to remove the mass of local infection to facilitate restitution of the patient to more normal physical condition, and (5) for any patient when in the experience of the surgeon there is uncertainty as to the safety of primary closed amputation.

With but rare exceptions this amputation should be done through the upper third of the lower leg and should be followed, when conditions permit, by a closed supracondylar amputation. All structures are cut in one plane. Preferably, if the extent of actual suppuration is not too high, the incision should be made just below the fleshy part of the calf. There should be no hesitation in doing this amputation through active lymphangitis. It may also be done through suppuration if additional drainage is given, opening widely any extensions to a higher level, provided of course the suppuration has not extended into or above the level of the knee joint. A tourniquet is used in these cases to permit a rapid operation because of the generally poor condition of the patient, because of the presence of extensive local sepsis and the corresponding desire to lessen the local manipulation, and because a subsequent thrombosis which might occur secondary to the use of a tourniquet is of less consequence in this type of operation than it would be in a primary closed procedure. All vessels are tied with catgut. A sterile boric acid ointment dressing is applied to the end of the stump and a large comfortable dressing with the knee joint immobilized by a posterior splint is then applied. It is not necessary to change the dressing oftener than every four or five days. If the response is satisfactory, the patient's temperature will drop to normal or near normal and remain at a satisfactory level. The secondary amputation is done in from ten days' to three weeks' time, depending on the general condition of the patient. Skin grafting or attempts to utilize this stump are advised only in the very rare instance.

Supracondylar Amputation.—A supracondylar amputation by means of a circular incision, with the level of the skin incision at the upper margin of the patella, is the simplest and safest closed amputation that can be done. It is indicated (1) for a condition permitting primary closure but requiring the shortest and safest operation, (2) for all patients with physical handicaps which would prevent subsequent use of an artificial limb, (3) for extensive infection, which makes lower amputation unsafe, (4) in gangrene of one half or more of a toe in the absence of pulsation in the dorsalis pedis

artery or (5) for pain with or without gangrene which does not respond to three weeks of careful hospital treatment.

A circular incision is used, going through the quadriceps tendon and opening into the knee joint just above the patella. After the skin incision is made, the amputation knife is changed or is wiped off with an alcohol sponge. The incision is then carried through the muscles medially, laterally and posteriorly. If the leg is elevated and the hamstrings are put on the stretch and then divided, they will retract. The nerve will be readily seen near the midline and should be clamped before it is divided to facilitate its later identification. With careful dissection the popliteal vessels are then found in the loose areolar tissue just deep to the nerve. These are divided between clamps and the remainder of the procedure is readily accomplished. The bone is divided at a distance above the level of the skin incision which equals approximately half of the diameter of the thigh at the level of operation. After treatment of the nerve and vessels, as already described, closure is done in an anteroposterior direction. Some care is necessary to place the femur in the midportion of the stump because of the unequal muscle balance in the lower thigh due to the more powerful adductor group.

Closed Amputation Through the Lower Leg.—This operation is restricted to a very select group of patients. It requires more technical skill and more local manipulation than a supracondylar amputation. It is done through a level at which the circulation is less adequate and where the incision is closer to the field of infection. It should not be done by the surgeon inexperienced in amputations; it should not be done for a patient whose general condition would contraindicate the use of an artificial limb. It can usually be done successfully when a patient is in good general physical condition, provided (1) there is good pulsation in the popliteal artery, (2) the skin at the level of the incision is in good condition, (3) there is no elevation of temperature or color change above the ankle and (4) there is no evidence of infection in the lymphatics or veins above the level of the malleoli.

The circular incision is not entirely practical in an amputation through the upper third of the lower leg. Extension of the incision upward along the course of the fibula for a distance of about 2 inches will greatly facilitate the procedure and will interfere with the circulation little if at all. The same principles of operation are carried out as described for the supracondylar amputation. A posterior splint should always be applied at the completion of the operation.

Gritti-Stokes Amputation.—This operation should not be done for a patient with diabetes or in senile gangrene unless the surgeon has had experience with it. It gives an excellent stump provided the limb maker is favorably inclined toward the resultant stump and utilizes the end bearing which it is capable of giving. It does not have sufficient advantages over a supracondylar amputation for these elderly patients to compensate for the increased technical difficulty. It has the same requirements as an amputation through the lower leg except that good collateral circulation around the knee joint may be of more advantage than pulsation in the main vessels. It is particularly useful for a heavy man who will be on his feet for long periods at a time.

THROMBOANGIITIS OBLITERANS

The patient with thromboangiitis obliterans will be a young or a middle aged man. He has largely within his power the ability to control progression of his disease by the cessation of all smoking and the acceptance of the general principles of good living. About the only indication for a major amputation in this condition is failure of a foot to heal after removal of one or more digits. The details of the local care of the thromboangiitis patient with gangrene of one or more toes cannot be entered into in this discussion but warrant careful review by the surgeon having such a patient under his care.

Should major amputation be indicated for the patient with thromboangiitis obliterans, there is some difference of opinion as to whether it should be done through the upper third of the lower leg or whether the patient should have a Gritti-Stokes amputation. Only rarely is it necessary to do a supracondylar amputation in this group of patients. Many men of experience prefer the Gritti-Stokes amputation in any patient with thromboangiitis obliterans who has not responded to the usual local procedure.

ARTIFICIAL LIMBS

Many patients with arteriosclerotic gangrene, particularly in the presence of diabetes, will never use an artificial limb. This is because of some general handicap such as a previous cerebral homorrhage, failing eyesight or poor general physical condition. The final ability of any of these patients to walk, however, will depend on the use of a temporary pylon during their hospital convalescence. The patient with a closed supracondylar amputation or with a Gritti-Stokes amputation which has healed promptly should be able to begin walking with a pylon during the third week after operation and should be ready for discharge approximately three weeks after the date of operation with sufficient experience in the use of the apparatus to permit him to carry on satisfactorily at home. If these older patients become accustomed to the use of crutches for weeks or months following the amputation, many will never walk who, if given the opportunity of earlier trial, would do well with an artificial limb. A rigid type of pylon, made either from plaster or with a leather bucket, is the safest and easiest for the older patients to manipulate.

If the patient has had an amputation through the lower leg, the early use of the pylon is not so important. If knee exercises are given and the knee is completely extended and flexed so that there is no contraction, these patients will all walk well if given an opportunity at a later time. In this older group it is not safe to apply the pressure necessary to support the patient's weight on a lower leg stump in less than five weeks from the time of the operation.

The time at which the patient will change from a temporary to a permanent type of artificial limb will depend on the progress he has made in walking with the simpler peg type of appliance and also on the rapidity with which the stump shrinks. It is fair to say that if any of these older patients are not able to walk on the temporary type of limb there is no justification for the expense involved in trying the more complicated permanent limb.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

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SATURDAY, SEPTEMBER 27, 1941

NONCOMMUNICABLE STREPTOCOCCI

Detailed studies of a recent institutional epidemic have led Coburn and Pauli [1] of Columbia University to propose an entirely new theory of infectivity with streptococci which may well prove to be of epidemiologic importance.

The epidemic began in the infants' ward of a New York hospital at a time when streptococcic infections of the upper respiratory tract were at their lowest seasonal ebb. The original source of the outbreak was apparently a 7 months old baby, admitted for pancreatic disease, but who after admission was found to have a progressive bronchitis; sputum and throat cultures showed a preponderance of type 12 hemolytic streptococci. At the time of this discovery all other patients, nurses and institutional personnel were clinically free from hemolytic streptococci. Following his admission three other infants developed type 12 streptococcus infections, and soon afterward seven nurses who cared for these infants acquired "sore throat," pyrexia and intense systemic symptoms, the throat flora of each nurse containing a preponderance of the type 12 organisms. The epidemic lasted about two months, during which time 13 children, 22 nurses, 2 doctors and 1 visitor to the children's ward were infected.

Meticulous epidemiologic and bacteriologic studies were made of this outbreak, the most striking observation being the evident difference between adult and infantile capacity to communicate the disease. The infected nurses did not communicate the infection to their associates in the nurses' home. After recovery, these nurses resumed their duties in other wards of the hospital. Although many of them remained throat carriers of type 12 hemolytic streptococci for months, none of them gave rise to a streptococcic infection in either infants or adults. In contrast with this finding, spread of the infection from infants was apparently uncontrollable, type 12 organisms from these children apparently having a striking capacity to colonize on the mucous membranes and skin of both children and adults. There is evidently an increased infectivity of streptococci following their establishment in the tissues of infants and children, or conceivably the opposite phenomenon, a loss of infectivity as a result of contact with adult tissues.

A key to the nature of this age differential was furnished by repeated failure to recover type 12 organisms from infants who were evidently spreading the infection. These infants had nonhemolytic streptococci in their throats, apparently indistinguishable from the normal throat flora. On repeated subculture in blood broth, however, these presumptive nonhemolytic organisms "dissociated" or mutated, giving rise to typical type 12 hemolytic colonies. Apparently type 12 organisms often exist as nonhemolytic variants in infant tissues, which variants are not demonstrable in the adult. Confirming this conclusion, it was found that type 12 organisms recently isolated from both children and adults showed a tendency to "dissociate," giving rise to atypical forms when cultivated in normal infant serum. The same organisms remained stabilized and developed only typical type 12 colonies when grown in adult serum.

Communicability is thus apparently a function of the "physiologic liability" of the organisms, or their tendency or capacity to develop new and presumably adaptive variants. In infant tissues this tendency is apparently increased or, at least, is not suppressed. In adult tissues microbic lability is apparently suppressed, the streptococci being stabilized in a typical but relatively noncommunicable form. There are hints in the literature that a similar age factor plays a part in Hemophilus influenzae [2] and pneumococcic [3] infections.

Coburn and Pauli emphasize the differences in the clinical picture in the different age groups. The infected adults all contracted pyrexia and had strongly positive throat cultures for weeks or months but escaped septic complications. Most of them developed relatively high titer antistreptolysins. The children showed little or no febrile reaction. Many of them acquired otitis media, skin infections or other septic complications. Few if any type 12 organisms were found in their throats or noses at a time when epidemiologic data indicated that they were spreading the contagion. Antibody formation was about 20 per cent of that in the adult.

Briefly summarized, their epidemiologic data indicate that streptococcic communicability is a function of the lability or adaptability of the micro-organisms, which lability is inhibited or suppressed by the "mature" antibodies of the adult, rendering the stabilized adult infections relatively noncommunicable.

1. Coburn, Alvin F., and Pauli, Ruth H.: J. Exper. Med. **73**: 551 (April) 1941.

2. Dochez, A. R.; Mills, K. C., and Kneeland, Yale, Jr.: Proc. Soc. Exper. Biol. & Med. **30**: 314 (Dec.) 1932.

3. Eaton, M. D.: J. Bact. **27**: 271 (March) 1934.

DURAN-REYNALS "SPREADING FACTOR"

In 1928 Duran-Reynals [1] of the Rockefeller Institute reported that extracts of normal rabbit testicle added to an injection fluid will greatly facilitate the spread of vaccine virus through dermal tissues and enhance to an extraordinary degree its infectivity and pathogenicity. Later a similar increase in toxicity or pathogenicity was demonstrated on adding testicular extract to diphtheria toxin or to a suspension of Staphylococcus aureus. Accelerated intradermal spread was also demonstrated with carbon particles. The increased dermal permeability apparently does not depend on any active vascular or nervous response, since increased diffusion occurs in excised skin and even in desiccated skin subsequently soaked in water.[2]

This "spreading factor" is of teleologic importance. It was extracted from semen, leech extract, bee sting and snake venom, with evidence that the seminal extract facilitates the migration and penetration of spermatozoa. Clinical interest in this synergic extract was enhanced by the discovery that the same or a similar "spreading factor" is formed by certain bacteria (e. g. Clostridium welchii), although most bacteria are free from this tissue aggressin.

A key to the probable method of action of testicular extract has been recently found by Chain and Duthie [3] of Oxford University, who report that substances containing the spreading factor will decrease the viscosity of synovial fluid and of vitreous humor in vitro, with the liberation of reducing substances. This observation suggests that the "spreading factor" is a "mucolysine," depolymerizing and hydrolysing the mucopolysaccharides of these viscous fluids. A viscous mucopolysaccharide has been recently isolated from synovial fluid and designated "hyaluronic acid." The active principle of testicular extract, therefore, is tentatively classified as a "hyaluronidase."

Hyaluronidases can be readily titrated by measuring the rate of decrease of viscosity of pure hyaluronic acid solutions. On applying this technic the English biochemists found that there is a strict correlation between hyaluronidase titer and spreading reaction in animal tissues. Meyer and his colleagues [4] of Columbia University have confirmed this observation but point out that some evidence suggests that hyaluronidase and the "spreading factor" are not identical, and they believe that several factors may be involved in the production of the spreading phenomenon.

The conclusion that the "spreading factor" is a mucolysine is equivalent to the assumption that a viscous substance chemically identical with synovial mucopolysaccharide is present in intercellular tissue spaces. This assumption is supported by the successful isolation of a highly viscous mucopolysaccharide from excised skin,[5] and proof that this dermal polysaccharide is rapidly depolymerized with loss of viscosity in the presence of testicular extract. The existence of an intercellular mucin of sufficient viscosity to prevent the spread of colloidal dyes or formed particles is also suggested by the ingenious studies of the hydrodynamics of interstitial tissue spaces recently reported by McMasters [6] of the Rockefeller Institute.

The demonstration of a mucin barrier interfering with intercellular drainage may be an important contribution to basic physiologic theory. It is one of the tragedies of the present war that such a promising line of investigation has been discontinued at Oxford University.

1. Duran-Reynals, Francesc: Compt. rend. Soc. de biol. **99:** 6, 1928; J. Exper. Med. **50:** 327 (Sept.) 1929.
2. McClean, Douglas: J. Path. & Bact. **34:** 459 (July) 1931.
3. Chain, E., and Duthie, E. S.: Nature, London **144:** 977 (Dec. 9) 1939.
4. Meyer, Karl; Hobby, Gladys L.; Chaffere, Eleanor, and Dawson, M. H.: Proc. Soc. E per. Biol. & Med. **44:** 294 (May) 1940.

DIETARY HEALING OF DENTAL CARIES

Sognnaes,[1] of the Department of Pathology, University of Rochester School of Medicine and Dentistry, reports that under certain favorable dietary conditions experimental dental caries in rats may be completely healed, with restoration of practically normal tooth structure. About ten years ago Hoppert and his co-workers,[2] of the Department of Chemistry, Michigan State College, showed that dental caries can be regularly produced in rats by feeding certain coarse corn rations. The stock ration in the Michigan State laboratory consisted of finely ground (60 mesh) yellow corn (60 parts), whole milk powder (30 parts), linseed meal (6 parts), alfalfa meal (3 parts) and sodium chloride (1 part). Many years' experience has shown that this ration is fully adequate for optimal maintenance in rats and that with its use dental caries practically never develops. When coarse corn meal was substituted for the finely ground corn in this mixture, however, progressive dental decay was initiated in the lower molars of practically all rats. Well developed cavities were demonstrable in about eight weeks. By the end of six months nearly all of the lower molar teeth showed extensive cavity formation. Examination of the teeth at an earlier stage showed frequent impaction of coarse corn particles in the lower molars, the subsequent tooth decay being presumably the result of the local action of acidogenic bacteria. This conclusion was interesting at the time, since it emphasized the importance of physical properties of the diet as contrasted with the minerals, vitamins and other chemical factors then overemphasized.

On repeating these experiments in the University of Rochester School of Medicine and Dentistry, Sognnaes produced severe dental caries in several groups of rats by the use of a similar coarse corn ratio. Animals

5. Chain and Duthie.[3] Meyer, Hobby, Chaffere and Dawson.[4]
6. McMaster, P. D.: J. Exper. Med. **74:** 9 (July) 1941.
1. Sognnaes, R. F.: Science **93:** 617 (June 27) 1941.
2. Hoppert, C. A.; Webber, P. A., and Canniff, T. L.: Science **74:** 77 (July 17) 1931.

killed at the end of one hundred days showed numerous carious disintegrations of the lower molar teeth, often with deep penetration, the cavity base being in close proximity to the pulp chamber. The lesion was evidently progressive, almost complete destruction of the lower molar teeth often taking place if the caries-producing diet was continued for from six to eight months.

Instead of all groups of carious rats being killed at the end of one hundred days, certain groups were then returned to their routine noncarious stock diet (finely ground fox chow). By the end of two months the previously recorded carious process was not only arrested but in many cases almost completely repaired. Under binocular examination the exposed dentin was found covered by a thick layer of secondary dentin more or less completely filling the earlier cavity. In some cases there was a perfect restoration of the original thickness, hardness and dental polish.

These observations offer a new experimental approach to the microscopic study of reparative processes in carious teeth. If an equally efficient regenerative process can be demonstrated or promoted by proper dental hygiene in man, Sognnaes's observation may well initiate a new era in practical dental prophylaxis and therapy.

Current Comment

CONSERVATION OF VISION

Organized efforts at control of trachoma are conducted by the Office of Indian Affairs and by five state programs. A recent report of the Committee on Conservation of Vision [1] points out that the results of treatment with sulfanilamide are encouraging although uniformly good results in all cases are not achieved by this means. After reviewing the various activities the report recommends in part that programs under way be continued until complete eradication of trachoma has been accomplished, that states in which the program does not include all affected areas and groups extend the services as needed, that program directors work toward uniformity of recording and reporting essential facts and that provisions be included in the trachoma diagnostic service for diagnosis of other serious eye defects. The portion of the report on eye health and protection in the defense program is devoted to a brief evaluation of deficiency diseases of the eye, defective vision among draftees, health services for national youth administration, expansion of venereal disease service as a prevention of blindness measure, physical examinations in industry, occupational eye diseases due to exposure to poisons, and exposure of the civil population in modern warfare. These main divisions are accompanied by brief discussions and a moderately extensive bibliography. The organized attempt to conserve vision is already showing signs of real effectiveness.

1. Report of the Committee on Conservation of Vision to the State and Provincial Health Authorities of North America, Washington, D. C., May 1941.

EFFICIENCY OF GAUZE MASKS

The experience in army camps and on shipboard during the first World War and the present possibility of pneumonia and epidemic meningitis in our army camps lend importance to a recent study [1] on the efficiency of hospital masks. In this investigation a series of fabrics and other filtering materials was subjected to quantitative evaluation with respect to resistance to air flow and also efficiency in filtering bacteria from the air passing through them. As might be expected, excellence in both directions was not necessarily shown for the various filtering materials. For instance, one layer of virgin wool flannel having forty-two by forty-two strands per inch and washed fifty times removed 100 per cent of the bacteria but possessed such a high resistance to air flow that its use is not practical. On the other hand, two layers of gauze forty-two by forty-two strands per inch showed a very low relative air resistance but filtered out only 74 per cent of the organisms. Again, cellucotton showed a very high filtering efficiency but there are certain disadvantages in its use. The Iowa group of investigators found that repeated laundering so changes the structure of ordinary cotton gauze that it becomes a good bacterial filtering material; they showed that six layers of gauze which had been laundered twenty times removes 97 per cent of the organisms and, at the same time, has a relatively low resistance to air flow. These observations will be of interest to the surgeon in the light of attempts to sterilize the air of operating rooms in the presence of the noses and throats of the operating team and gallery, which are potential sources of infection.

CONGRESS APPROPRIATES FOR NEW ARMY MEDICAL LIBRARY AND MUSEUM

On September 15 the Congress of the United States completed legislative action on a bill authorizing the War Department to purchase for $1,000,000 a site near the Folger Shakespearean Library for a new Army Medical Library and Museum to cost $3,750,000. Thus begins the final stage in the culmination of a project for which American medicine has been active for a good many years. Even approximate estimates calculate that the material now available in the Army Medical Library and Museum is worth at least $25,000,000 and could not possibly be replaced even at that price. The building in which the material now rests is a fire hazard of extraordinary character and so long has been that the mind of man cannot remember even the date when it first became unsuited to its purpose. It is hoped that the planning and construction of the new building will not be delayed a moment longer than is necessary, even by the intensity of the preparedness program. Indeed, if any question of priorities arises in relation to the construction of this project, the office concerned with that problem will do well to get action as quickly as possible. The invaluable material in the Army Medical Library is the very basis of much of the scientific work absolutely necessary to military efficiency.

1. Rooks, R.; Cralley, L. J., and Barnes, M. E., Pub. Health Rep. **56**: 1411 (July 11) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ANDERSON, Robert D., 1st Lieut., Buffalo.
BERMAN, Lawrence, 1st Lieut., Detroit.
COOLEY, Fred Everett, Jr., 1st Lieut., Dinuba, Calif.
DICKERMAN, Henry Street, Jr., 1st Lieut., Springfield, Ill.
FISHKIN, Ben Gerald, 1st Lieut., Chicago.
FORSYTH, James Edward, 1st Lieut., Albion, Mich.
GREENFIELD, Jack, 1st Lieut., Cleveland.
HAMMEREL, John Joseph, 1st Lieut., Billings, Mont.
JANDORF, R., Donald, 1st Lieut., Baltimore.
LAMBERT, Edward R., 1st Lieut., Santa Barbara, Calif.
LINDNER, Harold Handel, Captain, San Francisco.
MARIANS, Abraham, 1st Lieut., San Gabriel, Calif.
MARSHALL, Frederic Simon, 1st Lieut., Black Earth, Wis.
MATT, Wayland Paul, 1st Lieut., Portland, Ore.
McRAE, James Hendry, 1st Lieut., Detroit.
MITRICK, Joseph Martin, 1st Lieut., Chicago.
MUNAL, Harold Dean, Jr., 1st Lieut., Fresno, Calif.
QUASHNOCK, Joseph Matthew, 1st Lieut., Pittsburgh.
QUINN, Gerald William, 1st Lieut., Akron, Ohio.
RANDOLPH, Angus Crawford, 1st Lieut., Lynchburg, Va.
SANDLER, Nathaniel, 1st Lieut., Detroit.
STEINBOCK, Henry Fred, 1st Lieut., Villa Park, Ill.
WEST, Leonard A., Major, Bay Pines, Fla.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ALBANO, Frank J., 1st Lieut., Newark, N. J., Fort Jackson, S. C.
COHN, Herman R., 1st Lieut., Brooklyn, Pine Camp, N. Y.
DeMARCO, Mario M., 1st Lieut., New York, Camp Selby, Miss.
GERSTEIN, Jerome W., 1st Lieut., Brooklyn, Induction Station, Newark, N. J.
GREINER, George F., 1st Lieut., Jersey City, N. J., Fort Dix, N. J.
KATZ, Simon, 1st Lieut., Brooklyn, Pine Camp, N. Y.
LEHMAN, David J., 1st Lieut., West Orange, N. J., Fort Dix, N. J.
MARKS, Stuart B., 1st Lieut., Syracuse, N. Y., Fort Dix, N. Y.
McMAHON, Thomas A., Jr., 1st Lieut., St. Albans, L. I., N. Y., Fort Monmouth, N. J.
MOON, Dabney Von K., 1st Lieut., Plainfield, N. J., Induction Station, Fort Jay, N. Y.
SCHELL, Philip M., 1st Lieut., Baldwin, L. I., N. Y., Induction Station, Fort Jay, N. Y.
SCHWARTZFARB, Samuel, 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
SEIDEMAN, Thomas, 1st Lieut., Brooklyn, Induction Station, Fort Jay, N. Y.
SPOTA, George, 1st Lieut., New York, Pine Camp, N. Y.
TOWLEN, Leonard J., 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
WEINER, Leo, 1st Lieut., Brooklyn, Induction Station, Fort Jay, N. Y.
WEINTROB, Joseph, 1st Lieut., Atlantic City, N. J., Induction Station, Fort Jay, N. Y.
ZEILENGOLD, Milton, 1st Lieut., New York, Pine Camp, N. Y.

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Michigan and Illinois:

ARMALAVAGE, Leon J., 1st Lieut., Chicago, 1608th Corps Area Service Unit, Camp Grant, Ill.
BROWN, Arthur William, 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
CHOBOT, George R., 1st Lieut., Chicago, 135th Medical Reg., Camp Shelby, Miss.
CORTESI, Loli Raynold, 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
DVONCH, William J., 1st Lieut., Chicago, Station Complement, Fort Sheridan, Ill.
FAHRNER, Richard H., 1st Lieut., Joliet, Ill., Camp Shelby, Miss.
FORSYTH, James E., 1st Lieut., Albion, Mich., 1609th Corps Area Service Unit, Fort Custer, Mich.
FREDERICKSON, Lynn C., 1st Lieut., Chicago, Armored Force Replacement Training Center, Fort Knox, Ky.
GROSSMAN, Edward Stanley, 1st Lieut., Chicago, Headquarters and Station Complement, Corps Area Service Command, Camp Wheeler, Ga.
GUSTAFSON, Joseph G., 1st Lieut., Moline, Ill., Rock Island Arsenal, Rock Island, Ill.
HAMLIN, Courtney N., 1st Lieut., Rockford, Ill., 1608th Corps Area Service Unit (Medical Section), Camp Grant, Ill.
HANSON, Martin F., 1st Lieut., Havana, Ill., 33d Division, Camp Forrest, Tenn.
HESS, Edmond R., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
ILER, Rex L., 1st Lieut., St. Anne, Ill., 135th Medical Regiment, Camp Shelby, Miss.
JACOBS, Henry J., 1st Lieut., Spring Valley, Ill., 135th Medical Regiment, Camp Shelby, Miss.
JENNINGS, Laurence S., 1st Lieut, Chicago, General Dispensary, Chicago.
KOLB, Leonard H., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
LADEN, Edward L., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
LEADER, Abel J., 1st Lieut., Chicago, 210th C. A. (AA), Fort Sheridan, Ill.
LYNN, Harold P., 1st Lieut., Ypsilanti, Mich., 1609th Corps Area Service Unit, Fort Custer, Mich.
MAKART, Carl D., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
MANNING, Morey, 1st Lieut., Detroit, 1609th Corps Area Service Unit, Fort Custer, Mich.
MEYER, Harold I., Major, Chicago, 182d Field Artillery, Fort Leonard Wood, Mo.
MITRICK, Joseph M., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
MONGEAU, Donald C., 1st Lieut., Chicago, Fort Sheridan, Ill.
MURPHY, James P., 1st Lieut., Virden, Ill., 182d Field Artillery, Fort Leonard Wood, Mo.
NELSON, Clayton E., 1st Lieut., Chicago, 1611th Corps Area Service Unit, Fort Sheridan, Ill.
NORRIS, Harold V., 1st Lieut., Jacksonville, Ill., 33d Division, Camp Forrest, Tenn.
O'BRIEN, Donald Erwin, 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
OLSON, Carl P., 1st Lieut., Rockford, Ill., U. S. Army Induction Station, Chicago.
O'NEILL, Paul J., 1st Lieut., 420 Henry Street, Alton, Ill., 1623d Corps Area Service Unit, Fort Sheridan, Ill.
PFEFFER, Isadore S., 1st Lieut., Eloise, Mich., 135th Medical Regiment, Camp Shelby, Miss.
PORTE, David Morton, 1st Lieut., Chicago, Camp Shelby, Miss.
QUISLING, Gunnar D., 1st Lieut., Madison, Wis., 135th Medical Reg., Camp Shelby, Miss.
RAICHART, William A., 1st Lieut., Berwyn, Ill., 33d Division, Camp Forrest, Tenn.
REITMAN, Paul H., 1st Lieut., Chicago, 1607th Corps Area Service Unit, Fort Sheridan, Ill.
ROYCE, Emery, 1st Lieut., Sparland, Ill., Rock Island Arsenal, Rock Island, Ill.
SAVAGE, John L., 1st Lieut., Evanston, Ill., 33d Division, Camp Forrest, Tenn.
SCHNEIDER, Gerald E., 1st Lieut., Chicago, Headquarters and Station Complement, Corps Area Service Command, Camp Wheeler, Ga.
SHOEMAKER, John Calvin, 1st Lieut., Vassar, Mich., Camp Shelby, Miss.

SKOGMO, Bernhoff R., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
SMOLLAR, Leo, 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
THUERER, George, 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
VICKERY, Eugene L., 1st Lieut., Lena, Ill., 1608th Corps Area Service Unit, Camp Grant, Ill.
WALTON, William Hester, 1st Lieut., Belleville, Ill., Reception Center, Scott Field, Ill.
WEINTRAUB, I. Irving, 1st Lieut., East St. Louis, Ill., 61st Corps Area (AA), Fort Sheridan, Ill.
WIETERSEN, Fred K., 1st Lieut., Huntington Wood, Mich., U. S. Army Induction Station, Peoria, Ill.
WINSAUER, Henry J., 1st Lieut., Kohler, Wis., 29th Division, Fort Meade, Md.

Orders Revoked

BAUER, Benedict James, 1st Lieut., Detroit, 30th Division, Fort Jackson, S. C.
DOUGHERTY, Roderick J., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
FINCH, F. Sinclair, 1st Lieut., Armada, Mich., 33d Division, Camp Forrest, Tenn.
FORSYTH, James Edward, 1st Lieut., Albion, Mich., 1609th Corps Area Service Unit (Recreation Center), Fort Custer, Mich.
GANTZ, Hyman A., 1st Lieut., Waukesha, Wis., 33d Division, Camp Forrest, Tenn.
GUSTAFSON, Joseph G., 1st Lieut., Moline, Ill., R. I. Arsenal, Rock Island, Ill.
HAUSMANN, Richard K., 1st Lieut., Waupun, Wis., 202d Corps Area (A. A.), Fort Bliss, Texas.
KOZA, John L., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
LENTINI, Joseph R., 1st Lieut., Grand Rapids, Mich., 3d Armored Battalion, Camp Polk, La.
LOSEFF, Samuel A., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
MARESH, EVERETT R., 1st Lieut., Detroit, 33d Division, Camp Forrest, Tenn.
MAYKA, John P., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
MEYER, Harold I., Major, Chicago, Fort Leonard Wood, Mo.
MITRICK, Joseph Martin, 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
QUISLING, Gunnar D., 1st Lieut., Madison, Wis., 135th Medical Regiment, Camp Shelby, Miss.
ROYCE, Emery, 1st Lieut., Sparland, Ill., R. I. Arsenal, Rock Island, Ill.
SMITH, Eldon E., 1st Lieut., Battle Creek, Mich., 135th Medical Regiment, Camp Shelby, Miss.
WALTON, William Hester, 1st Lieut., Belleville, Ill., Reception Center, Scott Field, Ill.
WESCOTT, Royal James, 1st Lieut., Marquette, Mich., 182d Field Artillery, Fort Leonard Wood, Mo.
ZMYSLONY, Walter P., Captain, Milwaukee, 33d Division, Camp Forrest, Tenn.

SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

ANDERSON, Bruce Murat, 1st Lieut., Rochester, Minn., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
ASLING, Clarence Willet, 1st Lieut., Lawrence, Kan., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
BARNES, Asa, Major, Jefferson City, Mo., Corps Area Service Command Station Surgeon's Office, Fort Leonard Wood, Mo.
BAUER, Frank Louis, 1st Lieut., Shenandoah, Iowa, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
BURR, Sherwood Petersen, 1st Lieut., Iowa City, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
DOUGLAS, John Munroe, 1st Lieut., Rochester, Minn., Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.
ELLIS, Ralph Carlisle, Captain, Kansas City, Mo., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
ENGLERTH, Frederick Louis, 1st Lieut., Iowa City, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
FINK, Daniel Louis, 1st Lieut., Minneapolis, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
FINLAYSON, Alister Ian, 1st Lieut., Rochester, Minn., Corps Area Service Command Induction Station, Fort Crook, Neb.
HAFFKE, Oscar William, 1st Lieut., East Omaha, Neb., Cavalry Replacement Training Center, Fort Riley, Kan.
HENDERSON, Robert Wesley, Captain, Bismarck, N. D., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
HILL, Jack Harold, 1st Lieut., Kansas City, Mo., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
JENSEN, Uffe Trier, 1st Lieut., Des Moines, Iowa, Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.
MILLER, William Jacob, 1st Lieut., St. Louis, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
MILLS, Charles William, 1st Lieut., St. Louis, Corps Area Service Command Reception Center, Fort Des Moines, Iowa.
MORETON, Robert Dulaney, 1st Lieut., Rochester, Minn., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
NIXON, Ewing McNair, 1st Lieut., Little Rock, Ark., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
PURCELL, Harry Knox, 1st Lieut., St. Louis, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
ROSE, Forrest Ivan, 1st Lieut., St. Paul, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
WILSON, Fredrick Dale, 1st Lieut., Morning Sun, Iowa, Corps Area Service Command Station Surgeon's Office, Fort Riley, Kan.
WILSON, William Hildebrand, 1st Lieut., Rochester, Minn., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
ZEMLYN, Milton, 1st Lieut., St. Louis, Quartermaster Replacement Center Infirmary, Fort F. E. Warren, Wyo.

Orders Revoked

AMBRUSKO, John, 1st Lieut., Rochester, Minn., Basic Flying School (nonflying status), Taft, Calif.
ASLING, Clarence Willet, 1st Lieut., Lawrence, Kan., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
BOYD, Arthur Montgomery, 1st Lieut., St. Louis, Air Base, Fresno, Calif.
CARTER, Claud E., Captain, St. Louis, 35th Infantry Division, Camp J. T. Robinson, Ark.
CLINE, Edward Wilburn, 1st Lieut., Platte City, Mo., 35th Infantry Division, Camp J. T. Robinson, Ark.
GANLEY, William Coyle, 1st Lieut., Kansas City, Mo., Advanced Flying School, Mather Field, Calif.
HEIMANN, Verne Rodney, 1st Lieut., Albia, Iowa, Corps Area Service Command Induction Station, Fort Snelling, Minn.
HYATT, Robert Fee, 1st Lieut., Monticello, Ark., 3d Cavalry Brigade, Fort Riley, Kan.
JONES, Lynwood Beasley, 1st Lieut., Monticello, Ark., 35th Infantry Division, Camp J. T. Robinson, Ark.
LAWSON, Mason Glynn, 1st Lieut., Texarkana, Ark., 2d Cavalry Division, Fort Riley, Kan.
MAXWELL, Robert Hayden, 1st Lieut., Wichita, Kan., Basic Flying School, Taft, Calif.
MILLER, William Jacob, 1st Lieut., St. Louis, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
NOLAN, Bernard Patrick, 1st Lieut., Pine Ridge, S. D., 2d Cavalry Division, Fort Riley, Kan.
PETERS, Claude Frederick, 1st Lieut., Benton, Ark., 2d Cavalry Division, Fort Riley, Kan.
PROTHRO, Winston Boone, 1st Lieut., Arkadelphia, Ark., 2d Cavalry Division, Fort Riley, Kan.
SPEARS, Charles A., 1st Lieut., Billings, Mo., Air Base (nonflying status), Pendleton, Ore.
THOMPSON, Albert Wendell, 1st Lieut., Bentonville, Ark., 2d Cavalry Division, Fort Riley, Kan.

Relieved from Duty

ANNEBERG, Paul Daniel, 1st Lieut., Carroll, Iowa, Fort Leonard Wood, Mo.
CHLAD, Arnold Joseph, 1st Lieut., St. Paul, Fort Snelling, Minn.
DAVIS, Edward V., Captain, Kirksville, Mo., Jefferson Barracks, Mo.
GACUSANA, Jose Miranda, 1st Lieut., Sharon, Kan., Fort Riley, Kan.
KAISER, Max Elliott, 1st Lieut., Ottawa, Kan., Fort Leavenworth, Kan.
LEWIS, Leland Stanford, 1st Lieut., Garrison, Iowa, Fort Des Moines, Iowa.
MILDER, Benjamin, 1st Lieut., Chicago, U. S. Army General Dispensary, Chicago.
MOOS, Daniel James, 1st Lieut., Minneapolis, Fort Snelling, Minn.
PHILLIPS, Bert Lee, 1st Lieut., Bauxite, Ark., Camp J. T. Robinson, Ark.
PRESSMAN, Abraham, 1st Lieut., Belcourt, N. D., Fort Snelling, Minn.
SELLS, Robert Lee, Jr., 1st Lieut., Iowa City, Iowa, Fort Des Moines, Iowa.
SEVERIN, Matthew Joseph, Major, Omaha, Fort Omaha, Neb.
SHANER, John Frederick, 1st Lieut., St. Louis, Jefferson Barracks, Mo.
SNODGRASS, William A., 1st Lieut., Pine Bluff, Ark., Camp J. T. Robinson, Ark.
SWAN, Kenneth Carl, 1st Lieut., Iowa City, Fort Des Moines, Iowa.
SWANN, Clair Leo, 1st Lieut., Leavenworth, Kan., Fort Leavenworth, Kan.
THURLOW, Ralph Moody, Captain, Kansas City, Mo., Fort Leavenworth, Kan.
TYRRELL, Thomas Carroll, 1st Lieut., St. Louis, Jefferson Barracks, Mo.
WAYLAN, Thornton Lewis, 1st Lieut., Nashville, Kan., Pendleton, Ore.
WORD, Harlan Lamar, 1st Lieut., St. Paul, Fort Snelling, Minn.

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

AVES, Frederick Huston, 1st Lieut., Dickinson, Texas, Station Hospital, Fort Sam Houston, Texas.
BEATTY, Arch Joe, 1st Lieut., Denver, Station Hospital, Fort Sill, Okla.
BEAVER, William Carpenter, 1st Lieut., Pueblo, Colo., Station Hospital, Fort Sill, Okla.
CALDWELL, Pearson Cash, 1st Lieut., Mount Pleasant, Texas, Station Hospital, Fort Sam Houston, Texas
CLARK, Ralph O., 1st Lieut., Oklahoma City, Station Hospital, Fort Sill, Okla.
DeWARE, Jesse Marmaduke, 1st Lieut., Jefferson, Texas, Station Hospital, Fort Sill, Okla.
GILL, James Pope, Major, Corpus Christi, Texas, 5th Medical Supply Depot, Fort Sam Houston, Texas.
JOHNSON, Henry Myles, 1st Lieut., Supply, Okla., Station Hospital, Fort Huachuca, Ariz.
KOTIN, Paul, 1st Lieut., Arvada, Colo., Station Hospital, Fort Sill, Okla.
PARKER, Edward Ray, 1st Lieut., Frederick, Okla., Station Hospital, Fort Sill, Okla.
SCOTT, George Warren, 1st Lieut., Tishomingo, Okla., Station Hospital, Fort Sill, Okla.
WILLS, Charles Bennett, 1st Lieut., Denver, Station Hospital, Fort Sill, Okla.

Orders Revoked

HAMRA, Henry M., 1st Lieut., Phillips, Texas.
HIXSON, William Cooper, 1st Lieut., Galveston, Texas.

THE ASSOCIATION OF MILITARY SURGEONS

All physicians are invited to attend the meeting of the Association of Military Surgeons of the United States at the Brown Hotel, Louisville, Ky., October 29-November 1. The preliminary tentative program indicates that among the speakers will be:

Col. Harold D. Corbusier, M. R. C., U. S. Army, Presidential Address.
Rear Admiral Ross T. McIntire, Surgeon General of the Navy, Policies and Activities of the Medical Department of the United States Navy in the Present National Emergency.
Dr. Warren F. Draper, Assistant to the Surgeon General, U. S. Public Health Service, Present Policies and Activities of the United States Public Health Service.
Brig. Gen. Frank T. Hines, Administrator of Veterans' Affairs, Progress of the Part the Veterans' Administration Is Playing in the National Defense Program.
Major Frank B. Wakeman, M. C., U. S. Army, representing Major Gen. James C. Magee, Surgeon General, U. S. Army, Present Policies and Activities of the Medical Department of the United States Army.
Col. Robert H. Duenner, M. C., U. S. Army, Fort Knox, Ky., Medical Service of the Mechanized Forces.
Col. Paul E. Howe, Sanitary Corps, U. S. Army, Nutritional Problems of the Army.
Col. Fred H. Albee, M. R. C., U. S. Army, Treatment of Ununited Fractures of Importance to the Military Service.
Capt. Lucius W. Johnson, M. C., U. S. Navy, Medical Service at Remote Naval Bases.
Capt. William L. Mann Jr., M. C., U. S. Navy, Medical Arrangements for Combined Operations of Land Forces and Sea Forces (with motion pictures).

The following are scheduled for papers, the titles of which are not yet available: Major Gen. C. R. Reynolds, U. S. Army, retired, Brig. Gen. Leigh C. Fairbank, assistant to the Surgeon General, U. S. Army, Col. Irvin Abell, Louisville, Ky., Col. Leonard C. Rowntree, M. R. C., U. S. Army, chief, Medical Division, Selective Service System, Washington, D. C., Col. Raymond A. Kelser, Veterinary Corps, U. S. Army, and Lieut. Col. David N. W. Grant, M. C., U. S. Army, Office of the Chief of the Air Corps.

HOSPITAL WARD CARS

The War Department announced on August 14 that four hospital ward cars to be used with army hospital trains have been authorized. These cars, which will be converted Pullman cars, will cost $22,556 each. Each ward car will have beds for 32 patients, and two of them will be used with each hospital train. They will have also all the necessary facilities for the care of patients in a hospital ward. A standard hospital train for the Medical Department of the Army will consist of one administrative unit car, two of the ward cars and a variable number of the standard sleeping cars. The present hospital train has been developed after years of experimentation and knowledge gained during the World War in transporting soldiers, and they will get large scale practical tests during army maneuvers this fall. The administrative unit car contains an operating room, a kitchen capable of feeding five hundred if necessary, bunks, a shower for the kitchen personnel and an administrative office and quarters for the two officers in charge. Each of the new ward cars will have three army nurses and three orderlies working on an eight hour shift. The nurses will be quartered in drawing rooms in sleeping cars. Two of the hospital unit cars have recently been delivered and are now at the Medical Field Service School, Carlisle Barracks, Pa., and at Fort McPherson, Ga.

FOUR ARMY NURSES PROMOTED TO CAPTAINS

Four nurses with long service records in the U. S. Army Nurse Corps dating at least back to the first World War were promoted to the rank of captain in the nurse corps, August 15. These nurses were Genevieve Bergeson, Ruth Anderson, Alice Becklen and Joanna Peters, each of whom has been assigned to supervise the nursing service at hospitals ranging from 1,750 to 2,000 beds. With their promotion the Army Nurse Corps now has 35 captains, 29 of which have been promoted in the last year.

HEALTH SUPPLIES RATING PLAN OF DIVISION OF PRIORITIES

Fourteen categories of medical, surgical and dental essentials necessary to public health have been placed under a health supplies rating plan by the division of priorities in the Office of Production Management. The plan is designed to anticipate any possible delays in the production of health-preserving supplies.

The supplies to which the rating plan now applies are adhesive plasters, anesthesia apparatus and supplies, biologicals, antitoxins and serums, clinical thermometers, diagnostic instruments, hospital laboratory equipment and supplies, operating room equipment, hypodermic syringes and needles, instruments (surgical and dental), medicinal chemicals (limited to medicinal use only), rubber hospital sundries, hospital sterilizers, surgical dressings, x-ray equipment and supplies (medical and dental).

Manufacturers of the equipment and supplies in this list use many of the materials which have been placed under priority control because of scarcity. A manufacturer wishing to avail himself of the plan must make application to the Health Supplies Section, Office of Production Management, for a form "Requirements for Scarce Materials" and at the same time file a complete list of all the finished articles he manufactures that may be covered by the plan. If his application is granted, the priority rating of A-10 will be assigned to his orders for the scarce materials he has been unable to obtain.

The list of supplies covered by the rating plan was drawn up by the Health and Medical Committee of the Federal Security Agency, the Office of Price Administration and Civilian Supply and the Health Supplies Section of the Office of Production Management, in consultation with the Army and Navy Munitions Board, and will be revised from time to time as scarcities are relieved or threaten to develop, according to the announcement.

CARLISLE BARRACKS, PA., AN EXEMPTED STATION

The War Department has deemed it advisable to place all activities at Carlisle Barracks, Pa., under the direct supervision of the Surgeon General of the Army. The only military activities carried on at this station are those of the medical field service school. About a year ago Carlisle Barracks was placed under the command of the corps area commander, but actually it was under the command of three officers, namely the commander of the First Army, the corps area commander and the Surgeon General.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE

The Annual Conference of Secretaries of Constituent State Medical Associations will be held at the offices of the American Medical Association in Chicago on Friday and Saturday, November 14 and 15.

It is thought that the conference will be attended by the secretaries of all constituent state medical associations, by all of the editors of the medical journals of these associations and by officers and members of the Board of Trustees and administrative personnel of the American Medical Association. Presidents and other officers of the constituent state medical associations and of the component county medical societies who may desire to attend the conference will be cordially welcome.

It is expected that Surgeon General of the United States Army Major General James C. Magee, Federal Security Administrator Hon. Paul V. McNutt and Director of Selective Service System General Lewis B. Hershey will be present and take an active part in the program of the conference.

The official program will be printed in THE JOURNAL at the earliest possible time.

MEDICAL ECONOMIC ABSTRACTS

ILLNESS OF TRANSIENTS AND MEDICAL CARE

While the fact is never clearly stated, this study[1] might well have begun with a recognition of the fact that all Americans, save the Indians, are migrants or descendants of migrants who have been throughout our history constantly seeking a land of promise on a frontier that is no longer with us. It is no peculiarity of today that "migration is motivated largely by economic need" and only to a slight degree by ill health, even though there are at least 10,000 tuberculous transients who went to the Southwestern states and are now unable to pay for needed sanatorium care. Transients are no permanent section of the population, since 70 per cent of the families and 77 per cent of the unattached had been migrants for less than a year. They are persons who have been driven out of their homes, such as they had, by much the same sort of economic pressure that has driven generations of their ancestors on similar treks. They are naturally in the low income class with environments that make them subject to illness. "The pattern appears to be as follows: Among all interstate transients the most recent migrants have the least number of disabling illnesses, and as migration continues the incidence of disabling illness increases." Some of the reasons for this pattern are that traveling itself creates a risk of communicable diseases and illness is aggravated by insanitary conditions at camps and shelters. Migrants are "marginal individuals" to start with. Some have migrated because they are ill and they now receive less medical care than needy resident groups. Transients may carry diseases, and the camps and wretched housing conditions may make them centers of local infection.

In spite of the large part that migrants have played in American history there is a sort of local hostility to transients which has found expression in all sorts of legal limitations on public assistance to any but permanent residents. These laws place exceptional obstacles in the way of any form of relief, including medical. The main dependence for medical care is in clinics and outpatient departments, and especially such of these as are governmental agencies.

The diseases suffered by migrants are not particularly different from those of permanent residents. They suffer more accidents than the settled population because continuous traveling under unsafe conditions subjects them to increased dangers. The largest organization formed specifically for supplying medical care to transients is the Agricultural Workers Health and Medical Association in the Southwest. After pointing out that migration should be recognized as a permanent characteristic of American society and that there should be a national policy with an organization to direct and influence migration and "a program of hospital and sanatorium construction and maintenance and of public medical care for the medically needy, through the combined efforts of the federal government and the states," the recommendations conclude that "the federal government should neither formulate nor contribute funds to a health program organized exclusively for transients. . . . Determination of medical need and administration of all public medical care given to the transient should be allocated to that public medical agency in each community charged with similar responsibilities for needy residents."

1. Blankenship, C. F., and Safier, Fred: A Study of Medical Problems Associated with Transients, Public Health Bull. 258, Federal Security Agency, United States Public Health Service, 1940.

GOVERNMENT HEALTH SERVICES

According to a report of the United States Public Health Service, the first survey of the health services of state governments was made and published by the American Medical Association in 1915. The rapid expansion and wide diversification of such services in recent years has led to a new survey and report.[1] This extension of activities has spread to so many functions and been so widely scattered among governmental agencies as almost to defy classification. Thirty-five distinct activities were finally listed as of sufficient public health significance to be included in the investigation. These include such diverse items as vital statistics, control of such diseases (each a separate activity) as acute communicable tuberculosis, venereal, hookworm, pneumonia, malaria and cancer, and control of housing, plumbing, smoke, fumes and odors, rodents, shellfish, milk, pest mosquitos, food and drugs. Other activities embrace maternity, infant, preschool and industrial hygiene, school health service, general sanitation, supervision of hotels, restaurants and touring camps, mental hygiene and hospitals, care of crippled children, blindness, vocational rehabilitation, medical care for the needy, dental and laboratory service, health education, research, and licensure of health professions and agencies.

There is practically no order, system or planning in distribution of these activities among agencies of government.

Experimental work in one state showed plainly that, because of the overlapping and interweaving of health services provided by the several state agencies, the true comprehensive pattern could not feasibly be obtained through the medium of a mailed questionnaire. It was decided, therefore, that medical officers attached to the district offices of the United States Public Health Service should, through personal interview with the directors of the various health activities, collect the desired information. By this method, individual differences in interpretation of the questions were reduced to a minimum, and description of the exact function of each agency with respect to a specific health problem was facilitated. . . .

1. Mountin, Joseph W., and Flook, Evelyn: The Distribution of Health Services in the Structure of State Government, Pub. Health Rep. **56**: 1673 (Aug. 22) 1941.

The composite pattern of health activity for the several states includes contributions of state health departments, departments of welfare, agriculture, education, labor, mining, conservation, public utilities, engineering, public safety, state institutions and registration; of boards of control or boards of affairs; of state universities, independent hospitals and independent laboratories; of special boards, commissions or independent offices created especially for a particular activity, and of independent licensing boards.

In all, for the country as a whole, forty-eight separate agencies were listed as participating in one or another of the health activities included in this study.

Because the difference between many of these agencies was largely one of terminology, it was found possible to reduce them to seventeen classifications.

A table was then prepared showing the department of state government responsible for each of the thirty-five specific health activities in each state and territory, the District of Columbia and the Virgin Islands. The first impression which is given from the study of this table is largely one of confusion.

Realization that within a single state as many as eighteen separate agencies contribute something to the health activities covered is somewhat startling. In no jurisdiction are less than six agencies involved, and the median number of departments, boards and commissions concerned with programs having public health significance is eleven per state. When dispersion is viewed from the point of specific activity among all the states, the situation is quite as remarkable. Records for a few activities are cited. For the nation as a whole, fifteen different types of state organizations participate in food and drug control work; eleven are engaged in sanitation of water supplies; eleven touch on the problem of general medical care of the needy. The latter statement, by the way, represents only about three fourths of the areas included, because fourteen states make no provision for service of this type. Hospitalization of the tuberculous is the product of nine different types of state agencies, and hospitalization of mental patients of seven. Mental hygiene, a relatively new entrant into public health awareness, is split among nine separate organizations in the seventeen states which have initiated such activities. . . .

In magnitude, programs cover the entire range from regulatory functions only or advisory service only—and that limited to requests—to operation of complex direct service units. From the standpoint of organizational schemes, greatest variation exists among the states in their conception of the portion of responsibility to be borne by the state agency and the portion to be delegated to local jurisdictions. In one place it is the policy to limit state assistance to advice, supervision or promotion. In another, the state agency actively engages in direct service. In still another, the first plan is followed for some activities and the second plan for others. Distribution of financial aid for approved projects is also a form of state participitation now in common use.

After these steps have been taken, an effort was made to determine the cost of such services. It is admitted that this effort cannot claim any high degree of accuracy, although "it is believed that the expenditure figure finally obtained is more complete than that provided by any previous survey." The grand total of such expenditure for the United States is $285,715,800 annually. The approximate average per capita expenditure is $1.90, but this varies from Tennessee's $0.76 to Nevada's $4.26. The largest source of such expenditures is the state which accounts for 81.4 per cent. The local authorities contribute 3.9 per cent, the United States Public Health Service under title VI of the Social Security contributes 3.2 per cent, under the venereal disease 1 per cent and through the Children's Bureau title V 2.5 per cent; other sources contribute 8 per cent. There is nothing approaching uniformity in these ratios between the different states.

Full time administrative and field personnel engaged in carrying out the health programs of the various state agencies number 18,737. . . .

Because of the variability of part time employment, however, it has not been considered practicable to include other than full time personnel. Institutional employees have been omitted from the count likewise, because the data at hand in central state offices are not susceptible to breakdown by classification or by description of duties.

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Bill Introduced.—H. R. 5631, introduced by Representative Randolph, West Virginia, proposes to amend the healing arts practice act in the District of Columbia by imposing a citizenship requirement on applicants for licenses to practice the healing art.

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 3484 has passed the House and Senate, providing retirement pay and hospital benefits to Reserve Officers in the Army who were called or ordered into active military service by the federal government for extended military service in excess of thirty days on or subsequent to Feb. 28, 1925, other than for services with the Civilian Conservation Corps and who are now disabled from disease or injury contracted or received in line of duty while so employed.

Bills Introduced.—S. 1913, introduced by Senator White for himself and Senator Brewster, both of Maine, and H. R. 5676, introduced by Representative Smith, Maine, propose to create a Division of Water Pollution Control in the United States Public Health Service. Such sums as may be necessary will be appropriated, it is contemplated, for grants in aid or loans to carry out such projects or treatment works as are set forth in the budget by the President, provided that in no fiscal year shall the appropriation exceed the sum of $50,000,000. H. R. 5674, introduced by Representative Traynor, Delaware, undertakes to protect the public health by the prevention of certain practices "leading to dental disorders; and to prevent the circumvention of certain state laws regulating the practice of dentistry." The apparent purpose of this bill is to restrict mail order business in dentures.

WOMAN'S AUXILIARY

Arizona

The annual meeting of the Woman's Auxiliary to the Arizona State Medical Society was held recently at Phoenix. The women were welcomed by Mrs. Charles Ploussard, president of the Maricopa County auxiliary. Mrs. Jesse D. Hamer, state president, said that Yavapai County had recently reorganized and that the Pima and the Maricopa County auxiliaries have one hundred and twenty-five memberships. Pima County gave $100 to the Tucson Preventorium and $50 to the school milk fund. Maricopa County contributed to the Community Chest, the Crippled Children's Home and $5 a month to the school lunch project; also toys were distributed to children who were in the hospital at Christmas. Mrs. James Moore, chairman of legislation, told of the passing of House Bill 178 which gives osteopaths the right to do surgery by legislation and not by education. This bill was passed by both houses without a public hearing and signed by the governor of the state. A referendum was suggested and all doctors and their wives are now getting signatures for petitions. Dr. Henry F. Helmholz, professor of pediatrics at the University of Minnesota Medical School, talked to the auxiliary. Mrs. Harlan P. Mills of Phoenix was elected president for 1942. Mrs. B. B. Edwards of Tucson is the incoming president for 1941.

Ohio

Butler County organized a woman's auxiliary recently with the following officers: president, Mrs. C. I. Stafford, Oxford; vice president, Mrs. C. J. Chamberlain, Hamilton; recording secretary, Mrs. F. W. Brosius, Middletown; corresponding secretary, Mrs. George Flenner, Hamilton, and treasurer, Mrs. L. H. Skimming, Middletown.

Wisconsin

Three hundred women attended a benefit bridge party at Green Bay, given by the Woman's Auxiliary to the Brown-Kewaunee-Door County Medical Society. Proceeds were given to the St. Mary's Infant's Home. The committee in charge was made up of Mmes. R. B. Lenz, Louis Milson and Glenn Denys.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1125.

CALIFORNIA

Lectures on Pediatrics.—Dr. Horton R. Casparis, professor of pediatrics, Vanderbilt University School of Medicine, Nashville, Tenn., gave a series of lectures on pediatrics at various places in California during September. He lectured in Oakland, September 4-5; San Diego, September 10, and he conducted a course of lectures and clinical discussions before the Southwestern Pediatric Society in Los Angeles, September 11-12. Dr. Casparis also lectured in Phoenix, Ariz., September 2.

Dr. Bowman Named Director of Langley Porter Clinic.—Dr. Karl M. Bowman, director of the division of psychiatry, Bellevue Hospital, and professor of psychiatry at New York University College of Medicine, New York, has been appointed to direct the new Langley Porter Clinic, a neuropsychiatric unit of the state department of institutions, under the direction of the University of California Medical School, San Francisco. He will begin his new work at the clinic about November 1. The new $500,000 building is not expected to be completed by that time, but Dr. Bowman will begin the selection of personnel and arrange other organizational detail. The cornerstone for the new clinic was laid, April 5. The building is situated on the campus of the medical school and is named in honor of Dr. Langley Porter, dean emeritus and professor of medicine and lecturer in medical history and bibliography, emeritus, of the medical school. Dr. Bowman was born in Topeka, Kan., in 1888 and graduated at the University of California Medical School in 1913. According to a statement from the California Department of Institutions, Dr. Bowman will be employed partly by the University of California in the capacity of head of the department of psychiatry there and partly by the department of institutions in the capacity of medical superintendent of the Langley Porter Clinic. Half of Dr. Bowman's salary will be paid from the budget of the clinic and half from the budget of the department of psychiatry of the university.

DELAWARE

State Medical Meeting in Wilmington.—The Medical Society of Delaware will hold its one hundred and fifty-second annual session at the Delaware Academy of Medicine, Wilmington, October 7-8. The president, Dr. Emil K. Mayerberg, Wilmington, will deliver his address Tuesday. Other speakers on the program will include:

Dr. Norman Cutler, Wilmington, Some Aspects of Eye Muscle Problems.
Dr. Willard H. Kinney, Philadelphia, Significance of Hematuria.
Dr. William E. Bird, Wilmington, Littré's Hernia—A Case Report.
Dr. Kenneth M. Corrin, Wilmington, Treatment of Convulsions.
Dr. Joseph Stokes Jr., Philadelphia, Studies in Measles.
Dr. Harold W. Jones, Philadelphia, Discussion of the Transfusion of Whole Blood, Plasma and Serum.
Dr. Lawrence J. Rigney, Wilmington, Analysis of the Clinical Data of 47 Proved Cases of Carcinoma of the Pancreas.
Dr. George J. Boines, Wilmington, Diphtheria and Intradermal Scarlet Fever Immunization.
Dr. Adolph Walkling, Philadelphia, Treatment of Compound Fractures.
Dr. Margaret C. Sturgis, Philadelphia, Precancerous Lesions of the Uterine Cervix.

The annual banquet will be held at the Hotel Du Pont on Wednesday evening. The woman's auxiliary to the society will hold its annual meeting on Wednesday.

DISTRICT OF COLUMBIA

Campaign to Eradicate Rats.—A drive to eliminate rats from the District of Columbia has been announced by the District department of health, newspapers reported on September 3. An appeal has been issued to householders and housewives to cooperate in removing all sources of food and places where rats can find harborage and build nests. The campaign will be conducted on a block to block basis. Local health authorities, federal experts on rodent control and committees of the Medical Society of the District of Columbia and civic groups have been engaged in conferences for several weeks formulating plans for the eradication campaign.

FLORIDA

New Bureau for Malaria Control.—The state department of health has created a new bureau of malaria and placed Dr. John E. Elmendorf Jr., Jacksonville, in charge as director. The results obtained by a malaria department in Escambia County proved the need for such a division in the state department of health, it was said. The county unit is operating under the joint cooperation of the state board of health and the Rockefeller Foundation and will continue under the active supervision of the new state bureau. Activities of the new bureau include entomologic studies in counties where malaria is known to occur and clinical examinations in the schools. According to Florida *Health Notes*, 2,749 persons were reported to have died of malaria in Florida in the period 1930-1939. The state is said to outrank Louisiana, Georgia, Alabama and Texas in death rates from this cause and, in many counties, these rates have reached a level well over 100 per hundred thousand of population.

ILLINOIS

Society News.—The Henry County Medical Society was addressed in Kewanee, August 21, by Drs. Arthur F. Abt on "Blood Diseases of Children" and Aaron Arkin, "Blood Dyscrasias, Diagnosis and Therapy." Both speakers are from Chicago.——Dr. William B. Kountz, St. Louis, discussed "The Diagnosis and Treatment of Degenerative Diseases of the Heart and Blood Vessels" before the Madison County Medical Society in Highland, September 5.

Dr. Rector Goes to Michigan.—Dr. Frank L. Rector, Evanston, for eleven years midwestern field representative of the American Society for the Control of Cancer, has been appointed cancer consultant on a full time basis to the Michigan State Department of Health, Lansing, effective September 15. In his new position Dr. Rector will direct an educational program against cancer to fit allied, professional and lay groups. The program is under the joint auspices of the Michigan State Medical Society, the state department of health, the Michigan division of the Women's Field Army of the American Society for the Control of Cancer and the state department of public instruction. It is hoped ultimately to weld all professional groups, including dentists and nurses, into the program. Dr. Rector's work will be principally with individual physicians and the county medical societies, particularly in the rural areas. Miss Grace Townsend, who has been named his assistant, will devote most of her time to lay groups. Dr. Rector graduated at George Washington University School of Medicine, Washington, D. C., in 1907. He was at one time editor of *Nation's Health*, executive secretary of the Chicago Medical Society and a member of a specially appointed committee, under the auspices of the Institute of Medicine of Chicago, to make a survey of medical services in the penal institutions of Illinois.

Chicago

The Bevan Lecture.—Dr. William E. Ladd, Boston, will deliver the thirteenth annual Arthur Dean Bevan Lecture of the Chicago Surgical Society at the society's forty-first annual dinner at the University Club of Chicago, October 3. His subject will be "Children's Surgery and Its Relation to the Specialties." Dr. Ladd is William E. Ladd professor of surgery at Harvard Medical School, Boston. The professorship was endowed this year by a group of friends of Dr. Ladd in recognition of his contributions to the field of surgery in children.

New Head for Department of Surgery at Loyola.—Dr. Harry A. Oberhelman, associate clinical professor of surgery at Rush Medical College and senior attending surgeon at Presbyterian Hospital, has been appointed chairman of the department of surgery at Loyola University School of Medicine. He fills the vacancy that occurred when Dr. Louis D. Moorhead resigned his affiliation with the school as dean and professor and head of the department to devote his time to private practice. Dr. Oberhelman graduated at Rush Medical College in 1921. Dr. Francis J. Braceland, formerly of Philadelphia, is dean of the Loyola University School of Medicine.

Institute for Juvenile Research.—The Institute for Juvenile Research was made a division of the state department of public welfare by legislative action of the recent general assembly. According to the *Welfare Bulletin*, the new law gives to the director of the department of public welfare the authority to appoint the head of the institute, and thereby this ceases to be a code position filled by the governor. In effect, this position becomes subject to civil service regulations. There is also a change in title from director to superintendent, which is in keeping with administrative policy of allowing but one director in the department. Dr. Paul L. Schroeder was reappointed on July 1 as head of the institute with the new title of superintendent. He was first named in charge of the institute in 1930.

INDIANA

Changes in Health Officers.—Dr. Charles K. Kincaid has resigned as director of district number 3, state department of health, with headquarters in New Albany, to accept a similar position in Eau Claire, Wis., effective September 15.——Dr. Fred W. Grayston, Huntington, has been appointed health commissioner of Huntington County, succeeding Dr. James M. Hicks Jr., resigned.

Postgraduate Courses in Obstetrics.—The Indiana State Medical Association, in cooperation with the Indiana University School of Medicine and the state board of health, is again sponsoring both intramural and extramural postgraduate courses in obstetrics during the coming year. Four two weeks sessions will be given at the Coleman Hospital, Indianapolis. Each session is open to six physicians, who will reside at the hospital, where they can be in close contact with the clinical work both at the university hospitals and at the city hospital. The dates for these intramural courses will be October 13-25; January 12-24, 1942; April 13-25, 1942, and July 13-25, 1942. There will be no charge for room and board, and the required deposit of $10 will be refunded on the satisfactory completion of the course. The courses are made possible without cost through the cooperation of the bureau of maternal and child health of the state board of health with Indiana University Hospitals. They are under the direction of Dr. Carl P. Huber, associate professor of obstetrics at the medical school. The extramural courses are available by arrangement with Dr. Huber and are offered to any area of the state in cooperation with the local county medical society.

IOWA

Fifty Years of Practice.—Dr. Fred H. Howard, Strawberry Point, recently received a gold button from the Iowa State Medical Society denoting fifty years in the practice of medicine. ——Dr. Thomas F. Beveridge, Muscatine, was honored at the annual dinner of the Iowa-Illinois Central District Medical Association recently, when he was presented with a medal marking his completion of fifty years' practice.

Immunization Program.—The house of delegates of the state medical society has approved the continuation of the immunization program of the society's committee on child health and protection, and the week of November 3 has been tentatively set for this year's campaign. A departure this year would be the fulfilment of a recommendation by the committee that two injections of diphtheria toxoid be given, two to four weeks apart, instead of one injection as was employed last year. The state medical journal urges county medical societies to give serious consideration to the number of injections so that an agreement may be reached before the campaign starts. More than 70,000 vaccinations were performed during the state society's first immunization campaign in 1939. In 1940, 42,775 vaccinations against smallpox were performed and 54,031 against diphtheria.

KENTUCKY

State Medical Meeting.—The annual meeting of the Kentucky State Medical Association will be held at the Brown Hotel, Louisville, September 29 to October 2, under the presidency of Dr. William E. Gary, Hopkinsville. Dr. Frank H. Lahey, Boston, President of the American Medical Association, will deliver an address before a scientific session on "Diagnosis and Management of Lesions of the Stomach, Duodenum and Jejunum" and another at a public meeting on "Developments in Medicine, National, Economic and Scientific." Dr. Arthur Hale Curtis, Chicago, will also address the public meeting on "Unrecognized Features of Gross Pelvic Anatomy as Applied to Gynecological Surgery" and a scientific session on "Management of Primary Dysmenorrhea with Special Consideration of the Anatomy and Surgical Technic." Dr. Fred W. Rankin, Lexington, President-Elect of the American Medical Association, will be the speaker at the annual dinner, which is to be in honor of Dr. Rankin and Dr. Elmer L. Henderson, Louisville, president-elect of the state association and also a Trustee of the American Medical Association. Dr. Rankin's address will be on "The Medical Profession and Military Preparedness." Other guests will be Dr. Alphonse McMahon, St. Louis, who will discuss "Chemotherapy in Pneumonia" and Thomas G. Hull, Ph.D., Director of Scientific Exhibits for the American Medical Association, Chicago, who will participate in the scientific exhibit. The oration in surgery will be delivered by Dr. F. Guy Aud, Louisville, on "Changes in the Surgical Treatment of Peptic Ulcer" and the oration in medicine by Dr. A. Thornton Scott, Lexington, on "The Epilepsies."

MICHIGAN

Change in Health Officers.—Dr. Clayton C. Benjamin, Grant, has been named acting director of the Alger-Schoolcraft health unit for the coming year, succeeding Dr. Ervin J. Brenner, Manistique, who has been granted a leave of absence for postgraduate study at Johns Hopkins University, Baltimore. Dr. Benjamin will live in Manistique.

Extramural Courses.—A series of extramural courses for physicians will begin on October 1 at Hurley Hospital, Detroit, under the auspices of the state medical society and the University of Michigan Medical School, Ann Arbor, as follows:

October 1, Dr. Walter G. Maddock, Ann Arbor, Surgical Aspects of Gallbladder Diseases and Dr. John M. Sheldon, Ann Arbor, Office Management of the Allergic Patient.
October 8, Dr. Norman R. Kretzschmar, Ann Arbor, Recognition and Prevention of Accidents in Pregnancy, and Dr. Douglas Donald, Detroit, Medical Complications of Pregnancy (symposium).
October 15, Dr. Fredrick F. Yonkman, Detroit, Emergency Drugs in General Practice, and Drs. Richard M. McKean and Clair Fremont Vale, both of Detroit, Office Management of the Diabetic Patient (round table discussion).
October 22, Dr. Maddock, Diagnosis and Management of Cancer of the Gastrointestinal Tract, and Dr. John L. Law, Ann Arbor, Abnormalities of Growth and Development in Children.

MINNESOTA

Personal.—Dr. Philip C. Welton became superintendent of Buena Vista Sanatorium, Wabasha, August 1, succeeding Dr. Russell R. Hendrickson, who resigned to become superintendent of Sand Beach Sanatorium, Lake Park. Dr. Welton was formerly in Richfield, Utah, as a deputy state health officer.

State Program of Mental Hygiene.—A program of mental hygiene and mental testing in the state division of public institutions is announced in *Minnesota Medicine*. Dr. David E. McBroom, superintendent of the Minnesota Colony for Epileptics, Cambridge, has been named director of the program, and Dr. Royal C. Gray, Minneapolis, psychiatrist of state penal institutions, has been named acting superintendent of the colony. The appointments were effective on September 1. Dr. McBroom was president of the East Central Minnesota Medical Society this year.

NEW JERSEY

Society News.—Dr. Henry B. Decker, Camden, addressed the Gloucester County Medical Society, Woodbury, September 18, on "Diagnosis and Treatment of Some of the Commoner Dermatoses" and Mr. J. Lenox Gray, Newark, "Hospital Service Plan of New Jersey."——Dr. Isidor S. Ravdin, Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, September 12, on "Some Recent Advances in Surgical Therapeusis with Special Reference to Military Surgery."

NEW YORK

District Meetings.—The Sixth District Branch of the Medical Society of the State of New York held its annual meeting at Cooperstown, September 18, with the following speakers:

Dr. Gilbert Dalldorf, Valhalla, The Medical Examiner and the Coroner —Is New Legislation Needed?
Dr. Hugh Auchincloss, New York, Diagnosis and Rationale in Treatment of Carcinoma of the Breast.
Dr. Edward A. Strecker, Philadelphia, Involutional Melancholia.
Dr. Robert L. Levy, New York, Management of the Patient with Cardiac Pain.
Dr. Walter M. Boothby, Rochester, Minn., The Physiology of High Altitude Flying.
Dr. Norman H. Jolliffe, New York, Clinical Applications of Recent Advances in Nutrition.

The Seventh District Branch met on September 25 in Rochester. At the morning session speakers were Drs. George H. Whipple, Rochester, on "Plasma Proteins and Clinical Problems" and Walter E. Dandy, Baltimore, "Diagnosis and Treatment of Lesions of the Cranial Nerves." In the afternoon there will be four panel discussions, as follows: "Health and Disease in Infancy and Childhood," with Dr. Albert D. Kaiser as conductor; "Modern Drug Therapy," Dr. James H. Sterner; "The Gastrointestinal Tract from Medical and Surgical Points of View," Dr. William J. Merle Scott, and "The Puerperal Period and Its Complications," Dr. James K. Quigley.

New York City

Personal.—Mr. Karl Eilers, president of Lenox Hill Hospital and a former president of the Associated Hospital Service of New York, died, August 18.——Dr. Philip I. Nash, Brooklyn, was recently honored with a testimonial dinner in recognition of his activities in the Coney Island community for many years. He has been chairman of the medical board of the Coney Island Hospital and of the Harbor Hospital for many years. He was the first president of the Coney Island Chamber of Commerce. At one time Dr. Nash was president of the Medical Society of the County of Kings and was on the faculty of the Long Island College of Medicine.

Courses in Industrial Hygiene.—Two courses in industrial health will be given at the New York University Center for Safety Education during the fall term. One on "Industrial Hygiene and Occupational Diseases" dealing with modern methods and technics of industrial hygiene, accident prevention and health education will be given Monday evenings beginning on October 6. The other, "Industrial Hygiene and Accident Prevention for Nurses," will be given Tuesday evenings beginning on October 7. The courses are offered to insurance and industrial engineers, industrial nurses, inspectors and other interested persons. They will consist of fifteen two hour lectures, discussion and demonstration periods by experts in various fields.

Rockefeller Hospital Seeks Special Patients.—The Hospital of the Rockefeller Institute for Medical Research announces that patients suffering from certain diseases now under investigation may be referred to the hospital by physicians and others who are interested and who are willing to cooperate in this way. The diseases now under investigation are Bright's disease (children and adults with the nephrotic syndrome and with nephritis in the early stages), heart disease (advanced heart failure), rheumatic fever (children from 8 to 12 in the inactive stage of this disease, whose parents are willing to bring them to the outpatient clinic monthly from October to June), acute respiratory diseases (acute lobar pneumonia and acute bronchopneumonia in adults), neurotropic virus diseases (acute encephalitis and aseptic meningitis) and nutritional diseases (advanced nonmalignant diseases of the liver and muscular dystrophies and atrophies). Physicians should communicate with the hospital before sending a patient.

NORTH CAROLINA

Dr. Berryhill Becomes Dean.—Dr. Walter Reece Berryhill, acting dean of the University of North Carolina School of Medicine, Chapel Hill, since the resignation in 1940 of Dr. William deB. MacNider, has been appointed dean. Dr. Berryhill graduated from Harvard Medical School, Boston, in 1927. Afterward he taught at Western Reserve University School of Medicine, Cleveland, and was appointed university physician and associate professor of medicine at North Carolina in 1933. In 1937 he was made assistant dean.

OHIO

Postgraduate Meeting.—The Mahoning County Medical Society, Youngstown, will present Dr. Tom D. Spies, Birmingham, Ala., in a special postgraduate meeting, October 30. The meeting will be devoted to discussion of vitamins, with Dr. Spies giving a formal address in the afternoon, followed by an open forum at a dinner session.

Grants to Health Museum.—First gifts to the newly established Cleveland Health Museum came from the Cleveland Foundation, which granted $250 July 30 and the Thomas H. White Trust, which gave $1,500 in August. The grants will be used for workshops in the health education laboratory. The added equipment will allow the museum to make new displays, loan exhibits and duplicate material for traveling exhibits.

Lower Lecture and District Meeting.—The annual Lower Lecture of the Academy of Medicine of Cleveland will be presented in conjunction with the annual meeting of the Fifth Councilor District of the state medical association, October 9, in Cleveland. Dr. Chester S. Keefer, Boston, will present two papers in the afternoon on the sulfonamide drugs, and in the evening Ernest O. Lawrence, Ph.D., professor of physics and director of the radiation laboratory at the University of California, Berkeley, will deliver the Lower Lecture on "The Newer Physics in Medicine."

Personal.—Dr. Lorin E. Kerr Jr., recently health commissioner of Iron County, Mich., with headquarters in Stambaugh, has been named commissioner of the Lorain County health district with headquarters in Oberlin.——Dr. William B. Baily, St. Clairsville, health commissioner of Belmont County, has resigned to join the U. S. Public Health Service.——Dr. Lynne E. Baker, resident physician at the Hamilton County Tuberculosis Hospital, Cincinnati, has been appointed head of the tuberculosis division of the Florida State Board of Health, according to the *Ohio State Medical Journal.*

OREGON

Plague Infection.—Under date of August 14, plague infection was reported found in tissue from a ground squirrel, Citellus oregonus, shot July 30 at Fish Lake, 80 miles southeast of Burns, Harney County.

PENNSYLVANIA

Society News.—Dr. Ralph M. Tyson, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, September 8, on "Common Pediatric Problems."——Dr. Charles C. Higgins, Cleveland, addressed the Cambria County Medical Society, Johnstown, September 11, on "Management of Infections of the Urinary Tract."——Drs. Henry A. Gorman and Archibald R. Judd, Hamburg, addressed the Northampton County Medical Society, September 19, at the Northampton Country Club near Easton on "Collapse Therapy."——Dr. Joseph H. Barach, Pittsburgh, addressed the Jefferson County Medical Society, Punxsutawney, September 11, on "Present Day Treatment of Diabetes and Its Complications."

VERMONT

Committee to Administer Medical School.—A committee of administration has been appointed by the board of trustees of the University of Vermont, Burlington, to take charge of the medical school. Dr. Hardy A. Kemp recently resigned as dean to become dean of Ohio State University College of Medicine, Columbus. Members of the new committee are Drs. Clarence H. Beecher, chairman; Ernest H. Buttles and Arthur B. Soule Jr.

WEST VIRGINIA

Personal.—Dr. Thomas W. Nale, director of the division of maternal and child hygiene of the West Virginia State Department of Health, Charleston, has resigned to accept a position with the Carbide and Carbon Chemicals Corporation in South Charleston.——Dr. Henry R. Dupuy, formerly of Oakland, Md., has been appointed health officer of Berkeley County.——Dr. William A. Bevacqua, Parkersburg, has resigned as health officer of Wood County to enter private practice in Parkersburg.

District Meeting with Tuberculosis Association.—The sixth councilor district of the West Virginia Medical Association held a joint meeting with the West Virginia Tuberculosis and Health Association at Beckley, September 17-18. Guest speakers were Drs. Harry E. Kleinschmidt, director of health education of the National Tuberculosis Association, New York, who discussed "Tuberculosis in General Practice," and Jay Arthur Myers, Minneapolis, who delivered the George C. Rowell Memorial Address at a dinner meeting.

WISCONSIN

Course on Geriatrics.—The Medical Society of Milwaukee County has announced a course of postgraduate lectures on geriatrics to be given at Marquette University School of Medicine in November with the following speakers:

Dr. Jacob Meyer, Chicago, Gastroenterology in the Aged.
Dr. Oscar T. Clagett, Rochester, Minn., Treatment of the Aged from the Surgical Angle.
Dr. George M. Piersol, Philadelphia, The Problem of Aging from the Internist's Angle.
Dr. Hans H. F. Reese, Madison, The Central Nervous System in the Aged.

GENERAL

Journal to Publish Summaries in Spanish.—The *American Review of Tuberculosis* announced in its September issue that summaries of its original papers are to be added in Spanish translation, beginning with the October issue. The new plan will be carried out with the cooperation of Aristides A. Moll, M.A., secretary of the Pan American Sanitary Bureau, Washington, D. C., who will prepare or revise the Spanish translations.

New President of Drug Firm.—Mr. Erwin F. Fauser, general manager of the Australian branch of Frederick S. Stearns and Company, Detroit, manufacturing pharmacists, has been appointed president and general manager of the firm. He succeeds Mr. E. V. Fraenkel, who resigned. Mr. Fauser has been with the firm since 1913 and has been in Sydney, Australia, as assistant manager and general manager of the Australian branch since 1927.

Social Hygiene Association Disclaims Film.—The American Social Hygiene Association has issued a statement concerning a film entitled "Dust to Dust," said to be in circulation in various theaters throughout the country. At the showing some one gives out pamphlets and other literature, it is believed. It is thought that the sponsors of the film may be implying that the association is promoting or endorsing the picture. The statement says "We wish to make it clear that such film is not under our sponsorship, nor do we approve the picture, and we certainly do not have any relationship of any kind with the group that is showing the film 'Dust to Dust' as part of their show." The association asks health departments and social hygiene agencies to inform the headquarters at 1790 Broadway, New York, if they should become aware of the showing of the film.

Aid to British Pharmacists.—In response to a request from the British Pharmaceutical Society for aid in its efforts to help its members who have suffered losses and injuries in air raids, a group of pharmacists has registered with the U. S. Department of State under the title of "Aid to British Pharmacists" to make assistance available to their British colleagues. There is no formal organization of the group except the selection by unanimous vote of a treasurer, who will receive, acknowledge and disburse all donations received. It is suggested that checks be made to the order of "Aid to British Pharmacists" and sent to the treasurer, Mr. Samuel L. Hilton, 1033 Twenty-Second Street N.W., Washington, D. C. The announcement explains that, although the need for supplies and equipment is great, it is not feasible to accept such donations because of transportation difficulties. It is pointed out that many business enterprises have been wiped out by the demolition of stores, and owners have been killed, leaving their dependents without support except that furnished by sympathetic friends and relatives. Members of the group sponsoring "Aid to British Pharmacists" are James H. Beal, Ph.G., Fort Walton, Fla.; Ernest Fullerton Cook, Ph.M., Ivor Griffith, Ph.M., and Ambrose Hunsberger, Ph.M., Philadelphia; Andrew G. DuMez, Ph.D., Baltimore; Robert P. Fischelis, Ph.M., Trenton, N. J.; J. Leon Lascoff, Pharm.D., New York; Evander F. Kelly, Pharm.D., and Mr. Hilton, Washington, D. C.

Academy of Ophthalmology and Otolaryngology.—The forty-sixth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held in Chicago at the Palmer House, October 19-23, under the presidency of Dr. Frank R. Spencer, Boulder, Colo. Dr. Perry G. Goldsmith, Toronto, Ont., will be the guest of honor. A feature of the meeting will be a national defense dinner at which the speakers will be Sir Harold Gillies of London; Dr. Irvin Abell, Louisville, Ky., chairman of the American Medical Association's Committee on Medical Preparedness, on "The Role of the Physician in the National Defense Program"; Dr. Burt R. Shurly, Detroit, chairman of the academy's preparedness committee, "The Role of the Academy in National Defense," and Dr. Louis H. Bauer, Hempstead, N. Y., "Aviation Medicine." Dr. Samuel J. Kopetzky, chief of the medical division of the Selective Service System for New York City, will be narrator for a group of motion pictures presented by courtesy of the U. S. Army and Navy. Among speakers on the scientific program will be:

Dr. Everett L. Goar, Houston, Texas, An Evaluation of Recent Therapeutic Agents in Ophthalmology.
Dr. Alfred W. Adson, Rochester, Minn., Surgical Treatment of Vascular Diseases Altering the Functions of the Eye.
Dr. William F. Petersen, Chicago, Otorhinological Problems and the the Weather.
Dr. John M. Converse, New York, Injuries in Air Warfare.
Dr. Phillips Thygeson, New York, Treatment of Staphylococcic Blepharitis.
Dr. Charles T. Porter, Boston, Practical Uses of Chemotherapy in Ear, Nose and Throat Work.
Dr. Rea E. Ashley, San Francisco, The Use of Urea in Certain Diseases of the Ears, Nose and Throat.

At the opening general session there will be a symposium on vertigo presented by Drs. Francis Heed Adler and Bernard J. Alpers, Philadelphia, and William J. McNally, Montreal, Que. Mornings of the meeting will be devoted to instructional courses.

Meeting of Obstetricians and Gynecologists.—The thirteenth annual meeting of the Central Association of Obstetricians and Gynecologists will be held at the Hotel Roosevelt, New Orleans, October 2-4. The speakers will be:

Dr. Albert W. Diddle, Iowa City, Clinical Application of Ergonovine: Its Use During the Third Stage of Labor.
Drs. John A. Haugen and Claude J. Ehrenberg, Minneapolis, Diaphragmatic Hernia in the Newborn.
Dr. Curtis J. Lund, Madison, Wis., Relation of Inhalation Analgesia and Anesthesia to Asphyxia Neonatorum.
Drs. Lawrence M. Randall, Sim B. Lovelady and Fletcher S. Sluder Jr., Rochester, Minn., Uterine Bleeding Due to Benign Lesions.
Dr. Harley E. Anderson, Omaha, Use of Uterine Packs Impregnated with Sulfanilamide.
Dr. Everett D. Plass, Iowa City, Obstetric Syphilis.
Dr. Guy S. McClellan, Nashville, Tenn., A Review of Seventy-Five Cases of Eclampsia with Particular Reference to Late Cardiovascular Renal Effects.
Dr. John H. Morton, Chicago, Premature Rupture of the Membranes.
Dr. Irving F. Stein, Chicago, Gynecography in the Diagnosis of Ectopic Pregnancy.
Dr. William O. Johnson, Louisville, Ruptured Ectopic Pregnancy.
Dr. Philip F. Williams, Philadelphia, Nutrition Study in Pregnancy; Graduate Education in Obstetrics.
Dr. Maxwell E. Lapham, New Orleans, Postgraduate Hospital Teaching Program Through Consultation Service in Community Hospitals.
Dr. Laman A. Gray, Louisville, Clinical Evaluation of Pregnant Mare's Serum Hormone.
Dr. Phillip C. Schreier, Memphis, Office Curettage for Prolonged and Resistant Puerperal Bleeding.
Dr. Joseph W. Kelso, Oklahoma City, Complete Laceration of the Perineum and the Repair.
Drs. Clarence Leon Wilson and Henry Close Hesseltine, Chicago, Effect of Lymphogranuloma Venereum on Pregnancy, Labor and Fetus.

There will be two scientific sessions conducted at Charity Hospital, presented by local physicians. Dr. Thomas B. Sellers, New Orleans, will deliver his presidential address Friday evening at the annual banquet on "Louisiana's Contribution to Obstetrics and Gynecology."

CANADA

Canadian Medical Election.—Dr. Albert E. Archer, Lamont, Alta., was chosen president-elect of the Canadian Medical Association at the annual meeting in Winnipeg in June, and Dr. Gordon S. Fahrni, Winnipeg, became president. The 1942 meeting will be held in Jasper Park, Alberta.

Committee on Industrial Medicine.—The Canadian Medical Association at its annual meeting in Winnipeg in June established a committee on industrial medicine with Dr. John G. Cunningham, Toronto, as chairman. Its purposes in general were said to be to survey the situation and define the scope and objectives of industrial medicine, to consider the qualifications and training of physicians and nurses for services in this special branch and to take stock of the personnel and training situation. It was recommended that facilities be established in war industries for preemployment examination of workers, medical supervision of conditions of work and special examination of those already employed for early diagnosis and control of disease and maintenance of health.

LATIN AMERICA

Radioactive Phosphorus Sent to Peru.—Small shipments of radioactive phosphorus produced by the cyclotron at the University of California, Berkeley, have been sent by air to Lima, Peru, the New York *Times* reported, September 13. The artificially produced radioactivity lasts about two weeks and, since air transportation takes the phosphorus to Peru within two or three days after its manufacture, the material still has a useful period of about ten days, it was said.

Institute of Hygiene Established in Ecuador.—Aided by grants from the Rockefeller Foundation, the national government of Ecuador has established a National Institute of Hygiene in Guayaquil as a part of the national department of health. A building has already been constructed by the government, and the Rockefeller Foundation will provide funds for equipment and contribute to the salaries of the personnel and to the general expenses. The foundation will continue its support on a decreasing scale for five years until the government takes over full responsibility. It will also provide fellowships for the training of personnel. The first director will be Dr. Atilio Macchiavello of Chile, who will hold the position for two years to complete the organization. Dr. Juan A. Montalván, a member of the staff of the health department, will then become the director. Dr. Montalván is now in the United States in training for the position. There will be departments of tropical pathology, bacteriology and immunology, epidemiology, pathology and diagnosis, chemistry and food analysis, control of biologic products, production of biologic products and a number of general services. The Rockefeller Foundation has granted fellowships for the present year to Mr. José Crusellas Ventura, who is to take charge of the department of chemistry and food analysis, and to Dr. V. Mosquera Ferrés, who will be director of the department of pathology and diagnosis. Both are now in the United States visiting and studying in various institutions.

FOREIGN

Funds for Paderewski Hospital.—Funds collected in many parts of the United States for the Paderewski Testimonial Fund amounted to $10,922 during July and August, the New York *Times* reported. A remittance of $7,000 was sent to the Paderewski Hospital in Edinburgh, Scotland, recently established in connection with the Polish medical school there. Other funds were sent for Polish relief in London, Switzerland and Sweden.

CORRECTION

Fifteen Trainees in Each Hundred Rejected.—In the Medical Preparedness Section of THE JOURNAL, September 13, page 941, appeared an announcement from the War Department in which it was said that fifteen men out of every thousand examined for military training during March and April were rejected. It has been pointed out that the statement should have been "fifteen trainees in each hundred."

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 26, 1941.

Medical Problems of Flying in the Stratosphere

The use of airplanes known as American fortresses at a great height has brought up the problems of flying in the stratosphere. Not only have the engines to be supercharged but measures have to be taken to enable the crews to withstand the great cold and the highly rarefied atmosphere. At 36,000 feet the thermometer falls to minus 56.5 C. and the oxygen pressure is too low for respiration. Thus man as well as engine must be supercharged. The crews are all picked men, and the medical officer of the airdrome has himself flown in one of the fortresses to observe the reaction of the crew. More than 80 per cent of the men tried have been found unable to fly at the great height. Any one with fat on him is quite unfit. The crews are given a course in pressure chambers before the flying. In these they regulate their own oxygen supply and are told to let themselves become unconscious for a few seconds at least once, so that they may realize that it is nothing to be afraid of and become "oxygen conscious." A tingling below the knee and in the ankles is the most common sensation when climbing to a great height, and above 20,000 feet almost every one has a stomach ache for a short time. Badly filled teeth ache at above 25,000 feet, and so the crews require the regular attention of the dentist. The highly trained crews who took part in the recent attack on Brest did not report any serious discomfort. One man said that he had a feeling around his mouth and nose as though plaster of paris had dried on his face. The men in the rear of the aircraft, where they would feel the cold most, wore electrically heated clothing.

The Envelop Method of Treating Burns and Wounds

The treatment of burns and wounds by a new method, introduced by Surgeon Lieutenant Commander John Bunyan, is attracting attention. He holds that in the past success has been diminished by destructive antiseptics, by frequently changed dressings, painful to remove and destructive of adherent newly formed tissue, and by immobility and disuse of the part. A dressing which does not require changing is therefore desirable. It should be flexible, frictionless, bland to the tissues and transparent, so that progress may be observed. With the help of a manufacturer, envelops of coated silk, shaped for different parts of the body, were produced. For cleansing Bunyan uses a solution of electrolytic sodium hypochlorite, because it is the least irritant. The envelop is provided with an inlet and an outlet, so that a lesion of any part may be irrigated by inserting a glass nozzle. A simple adhesive seal is fixed to the proximal end of the envelop at the factory, so that by removing the protective gauze one produces a watertight seal by lightly pressing the adhesive to the limb and covering with an adhesive bandage.

So far the treatment has been mainly used for burns. Applied to a first degree burn the solution immediately relieves pain, and covering with adhesive plaster is all that is necessary. Second and third degree burns are washed with the solution, the envelop is applied and the solution is run through the envelop through the inlet. This irrigation is repeated three times a day. Good results from this method are reported from the Middlesex, King's College and London hospitals. The verdict of Mr. J. W. Hannay at the London Hospital is that other methods will heal a burn or bring it to the stage of grafting within comparable degrees of time, attention and discomfort, provided all goes well. But the great value of envelop irrigation is that in no case treated by it, with or without cleansing in the operating room, will anything more than mild infection occur.

Compensation for War Service Injuries

The Ministry of Health has issued a memorandum on war service injuries, which are distinguished from "war injuries" by not being confined to injuries caused by the enemy or in combating the enemy. A war service injury is an injury sustained by a civil defense volunteer and is defined as "any physical injury which the minister of pensions certifies to have been shown to his satisfaction to have arisen out of and in the course of the performance by the volunteer of his duties as a member of the civil defense organization to which he belonged at the time." Both war injury and war service injury, as defined, mean only physical injuries. Injury to the brain or injury to the eyesight as a direct result of concussion, shock from direct exposure to bomb explosion or blast in which the incapacity starts from the time of the incident, collapse from heart failure as a direct result of an air attack and similar injuries may be accepted as physical injuries. But the definition does not cover neurasthenia and similar sicknesses in which the symptoms are induced merely by apprehension and fears occasioned by enemy activity. Physicians are therefore directed not to issue a war or war service injury certificate in such cases. But if the patient is an insured person he would be entitled to health insurance benefits in the ordinary way. On the other hand, a person rendered incapable by a war injury or war service injury is, if insured, disentitled to sickness benefit under the insurance act for twenty-six weeks.

Bomb Damage to the University of London and Its Hospitals

In his annual report, the principal of the University of London, Mr. H. L. Eason, states that the intensive air raids on London fully justified the policy of dispersal adopted by the schools of the university in the summer of 1939. The damage to university buildings has been so severe and widespread that if the schools had been in London the work would have virtually come to an end for a time. The two most important schools are University College and King's College, which are each attached to a great hospital. University College has been repeatedly attacked by high explosive and incendiary bombs, and a large part of its buildings have been destroyed. About a hundred thousand of its books in the library have been damaged beyond repair by fire and water. King's College has been damaged to a less extent, but two of its hostels and its library have been severely damaged. About one third of Bedford College (for women) has been destroyed by fire. Birkbeck College has been damaged twice, many laboratories, the operating room, books and equipment being destroyed. Damage to a less degree has been done to King's College of Household and Social Science, the Imperial College of Science and Technology and the School of Oriental Studies. The London School of Hygiene has been severely damaged by high explosives.

The hospitals of the medical schools of the university have been severely damaged almost without exception, but, owing to the decentralization of staff, students and patients under the emergency medical service, medical education has been maintained at a high level. The Medical School of St. Bartholomew's Hospital has been almost completely destroyed, and the London School of Medicine for Women has been damaged considerably. The buildings of other medical schools have sustained little damage. Nothwithstanding decentralization and delays and difficulties due to disturbance of communications, the work of the university has been maintained at a high level.

The number of internal students in 1939-1940 was 25 per cent less than in 1938-1939 and this year will probably be 40 per cent below the prewar figure. In spite of exile in strange places and air raids, the performance of students at examinations has little changed, the percentage of passes and honors being much the same as in peacetime.

SWITZERLAND

(From Our Regular Correspondent)

July 15, 1941.

Swiss Society for Internal Medicine

At a recent meeting of the Swiss Society for Internal Medicine its chairman, Dr. O. Roth of Wintherthur, discussed the effects of cold, especially congelation urticaria. This type of urticaria does not differ clinically from other forms, but it is not of allergic etiology and yet is due to hypersensitivity. The anaphylactic process takes place in the cell. The histamine contained in inactive form in the cell is liberated by a hypersensitive condition and develops into a reaction. Dermatitis artificially induced in human beings sensitive to congelation urticaria is considerably more pronounced than in normal controls. Moreover, a true circulatory collapse can be brought about by means of cold similar to that known to be caused by histamine. In 1 case in which a human control remained in a bath at 60.8 F. for three minutes a collapse occurred which lasted about ten minutes. A histaminase preparation, therefore, may be employed in congelation urticaria.

G. Schönholzer of the medical clinic of the University of Berne discussed cardiac action and intrathoracic pressure. B. Steinmann discussed the relations between cardiac output and the electrocardiogram.

J. E. W. Brocher of Geneva spoke on lesions of the lumbosacral intervertebral disks. Walking in an erect position places a serious strain on the lowest disks. Falling on one's back or lifting heavy burdens frequently causes ruptures in these disks and anterior and posterior hernias of the nucleus pulposus. The clinical manifestations are lumbago, backache, sciatica and signs of nerve and root irritation. In the roentgenogram occasionally the following modifications are seen: narrowing of the last or next to the last intervertebral disk, reactive osteophytic proliferation at the sacrum, arthritic changes in the vertebral joints, especially in the lumbar region, narrowing of the articular spaces and forward or backward subluxation of the lowest lumbar vertebra. Ordinary roentgenograms may be completely negative. Myelography, on the other hand, may often disclose changes. In the presence of a hernia of the nucleus pulposus with a rearward direction, depression of the contrast medium can be observed. Such hernias can exert pressure on nerves and roots and cause severe radiating pains. Myelography is therefore indicated whenever severe, intractable pain occurs in the lumbar area or when radiating pains are encountered; also in cases of narrowing of the intervertebral disk, osteophytic growth in the sacral regions and in subluxation of the lowest vertebra. In most cases therapy is surgical. However, smaller hernias of the nucleus pulposus may show an extensive spontaneous reduction.

R. Hegglin discussed lung infiltration with positive Wassermann reactions. The disease is a peculiar atypical form of pneumonia running a subacute course and is associated with a strongly positive syphilitic reaction. The symptomatology is exceedingly uniform. Usually there is a history of general ailments and signs of bronchitis for days or weeks. Serious signs of disease are almost altogether absent. Examination discloses mostly an extensive diffuse bronchitis with a circumscribed focus of infection. The temperature is either afebrile or subfebrile. The roentgenogram reveals cloudy infiltrations of irregular contours and spotty stripes with no predilections as to site. Hegglin investigated the behavior of the Wassermann test in a large number of patients affected with pneumonia and pulmonary tuberculosis. Among 700 croupous patients and such presenting influenzal pneumonia there were seventeen positive reactions definitely due to syphilis. In 19 highly febrile cases he found only one or, at the most, two reactions which had to be interpreted as nonspecific and which merely suggested a reaction or were mildly positive. Only one strongly positive reaction was seen. The findings at necropsy were unable to explain it. In 403 other cases there were twelve nonspecific reactions, but in only one of these could the strongly positive Wassermann reaction be determined as not due to syphilis. Strongly positive syphilitic reactions in cases of atypical pneumonia running a similar clinical course are all the more remarkable. According to the investigations of Professor Grumbach, of Zurich, the Haemophilus influenzae bacillus is to be regarded as the causative agent. Tuberculosis could never be determined nor were spirochetes found. There is definitely no connection with influenza.

In the second scientific session Professor Karrer, chemist of Zurich, surveyed the chemistry of the vitamins and of some enzymes. G. Bickel of Geneva discussed vitamin deficiencies in medical practice. Vannotti and A. Delachaux of Lausanne discussed lactoflavin and F. Koller of Zurich vitamin K. M. Demole of Geneva discussed pancreas insufficiency in various dyspeptic conditions.

Personals

Dr. K. Lenggenhager has been appointed director and associate professor of the surgical clinic of the University of Berne, succeeding Professor Matti. Lenggenhager was for many years an assistant of Professor de Quervain. His special interests lie in the field of thrombosis and blood coagulation.

Dr. Clairmont, for many years professor of surgery, at the University of Zurich, has retired. Dr. Alfred Brunner, chief surgeon of the surgical division of the cantonal hospital of St. Gall, has been named as his successor. Brunner was for a number of years an assistant of Professor Sauerbruch and has made contributions to the surgical treatment of tuberculosis.

Prof. E. Oppikofer, for many years professor of otolaryngology at the University of Basel, has retired on account of old age. Dr. Erhard Lüscher, associate professor at the University of Berne, was appointed as his successor and as director of the clinic.

Marriages

EDWARD H. BREGMAN, Tombstone, Ariz., to Miss Hazel McGrath of Winooski, Vt., at Nogales, Ariz., January 22.

CHRISTOPHER PARNALL JR. to Miss Jean Folmsbee, both of Rochester, N. Y., in Washington, D. C., June 14.

JAMES P. MORAN, New London, Conn., to Miss Grace McNamara of Poughkeepsie, N. Y., June 7.

DAVID A. DAVIS, Springfield, Tenn., to Miss Alice Rebecca Roper at Winter Garden, Fla., in June.

KENNETH JEROME CHERRY to Miss Alice Palmer Cottingham, both of Richmond, Va., June 14.

JOHN OSBORNE MCNEEL, University, Va., to Miss Rose Lee Williams of Charlotte, N. C., June 16.

JULIAN W. ZINN, Dwight, Ill., to Mrs. Hazel A. Tatro of Buffalo, N. Y., in St. Louis, May 9.

WILLIAM L. VENNING JR., Durham, N. C., to DR. LAURA E. ROSS of Charlotte, June 13.

JOHN NYE COMPTON, Little Rock, Ark., to Miss Margaret Ann Lake of Gould, June 3.

EDMUND W. MCELLIGOTT, Chadron, Neb., to Miss Viola Shadbolt at Gordon, May 7.

PHILIP A. FUQUA, Joliet, Ill., to Miss Alice Ruth Campbell of Omaha, June 15.

WILLIAM P. WARD to Miss Dorothy Stoddart, both of Lincoln, Neb., June 7.

WALTER M. REINER, Omaha, to Miss Margaret Borg of Funk, June 4.

Deaths

Walter Stuart Woodruff ✦ Colebrook, Conn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; formerly instructor in otolaryngology at his alma mater; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; consulting otolaryngologist, New Rochelle (N. Y.) Hospital; past president and secretary of the Westchester County (N. Y.) Medical Society; served during the World War; aged 58; died, August 19.

Ira Eustace Harder, Dallas, Texas; Kansas City College of Medicine and Surgery, Kansas City, Mo., 1918; member of the State Medical Association of Texas; instructor in clinical surgery, 1929-1930 and assistant professor from 1930 to 1932 at Baylor University College of Medicine; fellow of the American College of Surgeons; served during the World War; formerly on the staff of the Parkland Hospital; aged 45; died, August 18, in St. Francis Hospital, San Francisco.

Jerome Martin Ziegler ✦ New York; Columbia University College of Physicians and Surgeons, New York, 1918; fellow of the American College of Surgeons; for many years police department surgeon; aged 47; chief of the genitourinary clinic, Mount Sinai Hospital; on the staffs of the Sydenham Hospital, Beth David Hospital, Riverside Hospital and the Montefiore Hospital, where he died, August 25, of sarcoma.

August Hermsmeier Wittenborg, Memphis, Tenn.; College of Physicians and Surgeons, Memphis, 1910; chief of the division of anatomy, histology and embryology and professor of anatomy at the University of Tennessee College of Medicine; member of the American Association of Anatomists; aged 57; died, August 21, in the University Hospital, Ann Arbor, Mich., of myocardial infarction.

John Randolph Tucker Carmichael, Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1936; first lieutenant in the medical reserve corps of the United States Army, stationed at Fort George G. Meade, Md.; aged 29; was found dead, August 29, of illuminating gas poisoning, self administered, during temporary duty in Washington, D. C.

George Maitland Biggs, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1904; professor emeritus of otolaryngology at his alma mater; fellow of the American College of Surgeons; served with the Canadian Army during the World War; aged 60; for many years on the staff of the Toronto General Hospital, where he died, August 23.

William Thomas Callery, Weehawken, N. J.; Fordham University School of Medicine, New York, 1913; member of the Medical Society of New Jersey; served during the World War; on the staffs of St. Mary's Hospital, Hoboken, and the Hudson County Hospital, Secaucus; aged 54; died, August 11, of carcinoma of the sinuses.

Charles Ferguson Hanmer, Salmon, Idaho; National Medical University, Chicago, 1905; member of the Idaho State Medical Association; at one time secretary of the advisory board of the Idaho Department of Law Enforcement; aged 64; died, August 20, of carcinoma of the colon and liver.

Frank Carl Schurz Blessing, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1899; member of the Medical Society of the State of Pennsylvania; for many years on the staff of the Southside Hospital; aged 65; died, August 19, in the Mercy Hospital of streptococcic septicemia.

Rayburn Castle Austin ✦ Ellettsville, Ind.; Graduate School of Medicine of the Division of the Biological Sciences, University of Chicago, 1932; president of the Monroe County Medical Society; aged 43; died, August 26, in Asheville, N. C., of injuries received in an automobile accident.

John Woodrow Barnhart, Clendenin, W. Va.; Medical College of Virginia, Richmond, 1939; first lieutenant in the medical reserve corps of the United States Army, Station Hospital, Fort Hayes, Columbus, Ohio; aged 28; died, August 18, of cerebral hemorrhage.

Joseph Swisher Cunningham, Gibson City, Ill.; Illinois Medical College, Chicago, 1902; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; member of the Illinois State Medical Society; aged 67; died, August 21.

Jethro D. Davidson ✦ Teague, Texas; Baylor University College of Medicine, Dallas, 1911; secretary of the Freestone County Medical Society; member of the school board; owner of a sanatorium bearing his name; aged 54; died, June 19, of brain tumor.

Thomas Franklin Dodd, Alexandria, Va.; Medical College of Virginia, Richmond, 1908; member of the Medical Society of Virginia; served during the World War; for many years connected with the Veterans Administration; aged 62; died, August 14.

Cloy Garver Brumbaugh ✦ Huntingdon, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1907; fellow of the American College of Surgeons; on the staff of the Blair Memorial Hospital; aged 57; died in August of pneumonia.

Charles Florent Puterbaugh, Tipp City, Ohio; Medical College of Ohio, Cincinnati, 1909; member of the Ohio State Medical Association; formerly coroner of Darke County; aged 69; died, August 16, of diabetes mellitus and heart disease.

John Victor Cowden, Butler, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1896; member of the Medical Society of the State of Pennsylvania; aged 71; died, August 19, in a hospital at Hamilton, Ont., Canada, of pneumonia.

William Christian Wagner, Traer, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Iowa State Medical Society; aged 69; died, July 20, of coronary thrombosis.

Luther La Fayette Wikle, Madison, Ala.; University of Tennessee Medical Department, Nashville, 1888; member of the Medical Association of the State of Alabama; aged 86; died, August 15, of coronary heart disease and arteriosclerosis.

Grace McCoskey ✦ Stockton, Calif.; Stanford University School of Medicine, San Francisco, 1914; for many years on the staff of the Stockton State Hospital; aged 57; died, August 14, in the Dameron Hospital of carcinoma of the liver.

Arthur Churchill Strong, Burlington, Iowa; State University of Iowa College of Medicine, Iowa City, 1909; served during the World War; aged 58; died, August 11, in Tucson, Ariz., of heart disease and pulmonary tuberculosis.

Ambrose Henry Witherspoon, Lawrenceburg, Ky.; Jefferson Medical College of Philadelphia, 1894; formerly local health officer; aged 71; died, August 14, in the Good Samaritan Hospital, Lexington, of hypertensive heart disease.

John J. Haydel, Plaucheville, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; member of the Louisiana State Medical Society; aged 62; died, June 25, of carcinoma of the stomach.

Frederick Norman Nichols ✦ Denton, Md.; University of Maryland School of Medicine, Baltimore, 1902; past president of the Caroline County Medical Society; aged 62; died, August 22, of multiple myeloma.

Frederick Nathaniel Bonine, Niles, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; aged 77; died, August 22, of arteriosclerotic cardiovascular disease and hypertension.

August Friedrich Knoefel ✦ Terre Haute, Ind.; University of Louisville (Ky.) Medical Department, 1903; on the staff of the Union Hospital; aged 61; died, August 27, of coronary thrombosis and myocarditis.

Francis Field Ellinwood, Princeton, N. J.; Bellevue Hospital Medical College, New York, 1891; aged 75; died, August 6, in the Morristown (N. J.) Memorial Hospital of carcinoma of the prostate.

Harriet J. Clark, Seattle; Saginaw Valley (Mich.) Medical College, 1899; aged 80; died, August 19, in the Providence Hospital of carcinoma of the rectum, diabetes mellitus and hypertension.

Elmer Jackson Hendren, Louisville, Ky.; University of Louisville School of Medicine, 1941; intern at the Louisville City Hospital; aged 29; was killed, August 16, in an automobile accident.

George Abram Zimmerman ✦ Harrisburg, Pa.; Baltimore Medical College, 1910; served during the World War; aged 61; died, August 15, in the Polyclinic Hospital of cerebral hemorrhage.

Howard Miller, Glen Rock, N. J.; Albany (N. Y.) Medical College, 1881; aged 83; died, July 3, in the General Hospital, Paterson, of bronchopneumonia, myocarditis and carcinoma of the prostate.

John William Huff, Baker, Ore.; Rush Medical College, Chicago, 1881; formerly health officer; aged 83; died, July 6, in St. Elizabeth Hospital of hypostatic pneumonia and peritonitis.

Wilfred John Hewson, Alma Center, Wis.; Northwestern University Medical School, Chicago, 1908; aged 57; died, August 7, in the Luther Hospital, Eau Claire, of heart disease.

Ellis Grover Kirby, Bowdon, Ga.; Atlanta Medical College, 1914; member of the Medical Association of Georgia; aged 56; died suddenly, August 8, of myocarditis.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Bliss Native Herb Tablets.—These are put out by the Alonzo O. Bliss Medical Company, Washington, D. C., which in March 1940 signed a stipulation with the Federal Trade Commission promising to discontinue certain advertising misrepresentations. Among these were the use of the words "positive relief" or similar ones to imply that the product relieves upset stomach, gas bloating pains, acid risings, lost appetite, sour stomach and headaches due to constipation or other causes and to imply that the product will flush the bowels or kidneys, stimulate the liver, cause a faster elimination of kidney waste or is a treatment for the stomach, unless the last-mentioned representation is limited to such action as it might have as a stomachic. In May 1940 another concern, Van Sant, Dugdale & Co., Inc., Baltimore, apparently an advertising agency, also promised the Commission that it would discontinue employing certain advertising misrepresentations similar to the foregoing ones, in the promotion of the Bliss tablets. There are on record no fewer than 19 cases in which federal courts have declared that this product has been labeled under false and fraudulent claims.

Cashmere Bouquet Soap.—On July 6, 1940, the Federal Trade Commission reported that it had entered into a stipulation with the Colgate-Palmolive-Peet Company, Jersey City, N. J., which promised to discontinue certain unwarranted representations in the sale of this soap. Among them were that either this soap or its lather will remove "every bit" of dirt and cosmetics from every pore, or that this soap is capable of causing the skin to become alluring, clear or smooth in cases in which such results will not be achieved by cleansing the skin.

Ce-Kelp.—This "gift of nature" to man is put out by a Melvin E. Page, trading as the Dental Research Company, Muskegon, Mich. In March 1940 Page signed a stipulation in which he promised the Federal Trade Commission to discontinue certain misrepresentations in the advertising of "Ce-Kelp." Among these were that the product is "rich in minerals"; that it prevents or corrects what physicians call the deficiency diseases; that heart trouble, tuberculosis, anemia, high and low blood pressure, hardening of the arteries, rheumatism, neuritis, arthritis, kidney and bladder trouble, frequent colds, nervousness, constipation, acidosis, pyorrhea, overweight and underweight, cataract or cancer is recognized or properly classified as being a deficiency disease; that the main cause of deficiency disease is lack of mineral elements in ductless glands, or that "Ce-Kelp" or any other kelp product is "literally packed" with such essential elements. Page also promised to cease designating himself as "Dr." or "Doctor" unless it is clearly disclosed that he is a doctor of dentistry and not of medicine.

Companion Exerciser.—In April 1940, Joe Bonomo, trading as Joe Bonomo Publications, New York, promised the Federal Trade Commission that he would discontinue certain misrepresentations in his advertising. Among these were that the use of an elastic device which he sold as the "Companion Exerciser" will cause a return of pep, vitality, energy or better complexion right from the start or in any specified time; that his course designated "Muscle Tension System" will make the user a real man quickly or give brawny strength, burly health or a "he-man" body; that his course designated "Complete Bonomo System" will enable one to excel in any form of sports or make the user a physical wonder, and that the "Beautify Your Figure" course will cause the user to acquire "inviting contours" quickly or in any specified time.

Dare's Mentha-Pepsin.—This is a preparation of International Laboratories, Inc., Rochester, N. Y. In June 1940 this concern stipulated with the Federal Trade Commission that it would cease representing that the product is a competent treatment or effective remedy for stomach ailments; that any given amount of it will prove its efficacy in a definite time, and that it contains ingredients which will invigorate the stomach generally or are so combined with pepsin as to make the pepsin highly efficacious and speedy in its action. The concern also agreed to cease further use of the word "Pepsin" alone or with other words, to designate any preparation not containing sufficient pepsin as an active ingredient to possess therapeutic value because of it.

Dr. J. A. Dickey's Eye Water.—James J. Durr, operating as Dickey Eye Water Company, Montgomery, Ala., promised the Federal Trade Commission in May 1940 to cease representing that this preparation is superior in beneficial qualities to any other preparation used for the same purposes; and that it is recognized as a standard preparation for the eyes and is capable of curing or healing.

Dr. Pierce's "Favorite Prescription" and "Golden Medical Discovery."—Advertising material issued by the World's Dispensary Medical Association, Buffalo, has stated that the first named product contains extracts of the roots of lady's slipper, black cohosh, blue cohosh, unicorn and Oregon grape root, with viburnum, and that the second one contains queen's root, stone root, cherry bark, blood-root, Oregon grape root and sacred bark (cascara sagrada). The quantities of these drugs, however, were not named. In January 1940 the Federal Trade Commission reported that the Pierce concern had agreed to cease representing that "Dr. Pierce's Golden Medical Discovery" will keep the digestive system in tune, counteract excess acidity of the stomach or of itself build up the human system, relieve a weakened condition, increase weight, pep, energy, vigor or vitality, or is the one or only recognized tonic; or that "Dr. Pierce's Favorite Prescription" is of any appreciable value in relieving the pain or discomfort associated with menstrual distress, unless in direct connection therewith it is stated that such results may follow only when used for some length of time. The company further stipulated that it would desist from representing, by use of the word "Association" or words of similar import, that it is an association of doctors or medical men, or that complete medical advice is given to persons writing for it. In December 1939 a trade journal reported that the concern had changed its name to Pierce's Medicines, Inc.

Dr. Weaver's Nasal Filter.—This product was represented by the Nasal Filter Company, Columbus, Ohio, to cure or prevent hay fever and relieve or prevent asthma and sinus trouble and also to ward off anthracosis or provide a defense against colds or prevent all dust from entering the nostrils. In April 1940 the concern promised the Federal Trade Commission to discontinue these misrepresentations. The company has stated elsewhere that its so-called "Special Medicated Oil," which goes with the device, consists of 192 minims of wintergreen in a gallon of mineral oil. It seems rather preposterous, therefore, to speak of it as a medicated oil. The concern also has declared that this oil is used solely for its physical properties, through which it impregnates the wool fiber and causes the pollen and dust to adhere to the fiber rather than to be partially forced through the wool mats and thus into the nostrils.

El Panel Cuban Wonder Honey.—This is put out by an Albert H. Hoffman, Tampa, Fla., trading as Hoffman Health Products Company. In August 1940 Hoffman promised the Federal Trade Commission that he would cease advertising that his honey has a natural lubricating effect that helps to eliminate waste and thus promotes better appetite and consequently better assimilation; that it has nine mineral elements which have special virtues in supplying mineral needs of the body or that it vitalizes, alkalizes and affords special virtues in the treatment of anemia and poor appetite; that it assists in relieving and overcoming attacks of asthma, bronchitis, colds, hay fever, sinus trouble or coughs other than local throat irritations, possesses remedial powers in the treatment of gastric ulcers and disorders of the bowels and colon or differs essentially from domestic varieties of honey in the matter of nutritional or therapeutic value.

"Eugenics and Sex Harmony" and "New Birth Control Facts."—These two books are sold by Pioneer Publications, Inc., New York. In April 1940 this concern signed a stipulation with the Federal Trade Commission agreeing to withdraw certain misrepresentations in its advertising. Among these were that the method outlined in "New Birth Control Facts" is dependable as a means of avoiding and of causing conception, and that the book contains a table of periods during which conception is impossible. In its stipulation the company admitted that as to a substantial number of persons the method outlined is not effective, and that for a substantial number there is at present no way of exactly computing the periods in which conception is impossible. The respondent agreed to cease representing that the method outlined is dependable in bringing about or avoiding conception, and that the book contains a table of information which, if followed, enables all users to compute a safe period.

Fertility Calendar.—This is put out by one Edwin Rees, doing business as the Health Calendar Company, Cleveland. In October 1940 Rees signed a stipulation with the Federal Trade Commission in which he agreed to cease and desist from certain misrepresentations in his advertising. Among these were that conception may be completely controlled or partially controlled to any definitely stated percentage by using the "Fertility Calendar," a mechanical chart, or any other device designed for the purpose of making calculations necessary to practice the Ogino-Knaus Law of Conception; that the problem of birth control is solved by using the Fertility Calendar or any similar device or by practicing the Ogino-Knaus Law of Conception; that physicians are either unconscientious or disreputable by reason of having prescribed methods of birth control other than the Ogino-Knaus Law of Conception method; that the use of methods of birth control other than the Ogino-Knaus Law of Conception on prescription of competent physicians, in most cases and without substantial exceptions, results in pelvic infections and other ailments, and that the "Fertility Calendar," as compared with other devices designed for the same or similar purpose, is superior in the following respects: It applies to menstrual cycles of any length from twenty-one to thirty-six days; it tells the fertile and sterile days without any figuring; it is adjustable to months of any length, including the twenty-nine-day month of February in leap year, and it requires only three simple moves to indicate the fertile and sterile days in any given case.

Firma-Tone.—This is a product of Barbara Gould, Inc., New York. In August 1940 that concern stipulated with the Federal Trade Commission that it would discontinue certain misrepresentations in its advertising. Among these were that "Firma-Tone" is a competent treatment for conditions of relaxed facial contours, heaviness of the jaw line or flabby skin; enables the user to "hold the clean, firm contours of youth" or to have "youthful" contours of face and neck; stimulates, exercises, tones or strengthens the muscles of the face and neck, or gives "lasting

results." The company further agreed to cease using the designation "Firma-Tone" for its product or to represent that use of such product may be relied on either to "firm" the facial or neck contour of the user or to "tone" the skin or muscles.

H. E. Clarke's Nasal Filter.—This is put out by one H. E. Clarke, trading as H. E. Clarke Company, Pittsburgh. In July 1940 he stipulated with the Federal Trade Commission that he would discontinue certain advertising misrepresentations. Among these were that his device is of value in the prevention of any nasal irritation, except when caused by the inhalation of dust or other impurities through the nostrils, or that it will afford complete protection against nasal irritation which might result in such manner. Clarke further agreed to desist from exaggerating the extent to which his device will protect against or lessen the severity of any disease, ailment or condition and from representing that it is an effective agent in protecting against colds; that it is completely invisible when inserted in the nostrils; that generally physicians have recommended it; that the mat filters used in his device are sterile, or that the patent application covering his product affords complete or full protection.

HF.—The Pritchard and Thompson Advertising Agency, Inc., New Orleans, promised the Federal Trade Commission in January 1940 that it would discontinue advertisements which represent, directly or by implication, that "HF" is a remedy and a complete treatment or cure for athlete's foot; that other preparations are not beneficial in treating this condition or disease and will not reach the parasites causing it, and that the use of "HF" will keep a person "rid" of this disease or condition and eradicate the germs causing it. Other representations to be discontinued by the agency are that the use of "HF" will cause the itching accompanying athlete's foot to stop; that the product is world renowned and that more money has been spent for advertising it in a given time than for any other athlete's food medicine. Previously, the Commission had announced, in August 1939, that Gore Products, Inc., New Orleans, which put out this preparation, had similarly promised to discontinue the misrepresentations in question.

Kru-Gon.—This was advertised to be, among other things, a competent remedy for indigestion, gas pains, bloating, neuritis, rheumatism, nervousness, insomnia, kidney trouble and rundown condition and capable of removing poisons from the system in a natural manner, giving back health, ending attacks of indigestion, correcting kidney disorders, making the stomach function properly and giving relief after other remedies have failed. In January 1940 the Federal Trade Commission reported that D. S., S. B. and Hattie M. Evans, trading as Evans Drug Company, Springfield, Mo., which sells "Kru-Gon," and Medora Whinrey, owner, and Robert B. Whinrey, manager, trading as the Kru-Gon Company, Muncie, Ind., which manufactures the product and prepares the advertising claims, had promised to discontinue the foregoing misrepresentations.

Lovalon Hair Rinse and Lovalon Oil of Lemon Hair Rinse.—In July 1940 Marcus-Lesoine, Inc., L. J. Marcus and John A. Lesoine, San Francisco, promised the Federal Trade Commission to stop making certain misrepresentations in the sale of these products. Among these were that "Lovalon Hair Rinse" is a vegetable preparation, that it gives hair more life, that it is permanent in effect and enables one to say goodbye to dull or drab hair; that "Lovalon Oil of Lemon Hair Rinse" accomplishes the same results as a lemon rinse, that it restores natural loveliness of the hair or that it invigorates the scalp or hair. "Lovalon Hair Rinse" was granted a United States patent some years ago. The patent specifications indicate that the product, at least at that time, was nothing more than a mixture of 10 pounds of commercial tartaric acid crystals or powder mixed with 3 teaspoons of aniline dye and made into a powder. Just which of the aniline dyes is used in this product was not stated, but doubtless it varies with the color that the purchaser desires.

Mellquist Massage Balm.—In August 1940 the Federal Trade Commission announced that it had signed a stipulation with the Mellquist Reducing and Cosmetic Salons, Inc. (a New York Corporation), Mellquist Reducing and Cosmetic Salons, Inc. (an Illinois Corporation) and Erik W. Mellquist, New York, individually and as an officer and director of both corporations. In this stipulation Mellquist and his concerns promised to cease and desist from using in their advertisements and advertising matter, or in any other way, statements or representations the effect of which tends or may tend to convey to purchasers the belief that use of the product in and of itself will break down fat cells and strengthen tissues, or in any way reduce the user's weight or otherwise solve the user's reducing problems.

Nestle Colorinse and Nestle Shampoo.—The first named is a hair dye, and both are put out by the Nestle-LeMur Company, New York. In May 1940 this concern signed a stipulation with the Federal Trade Commission to discontinue certain misrepresentations in the sale of these products. Among them were that the "Colorinse" is not a dye, that it improves the natural color of the hair or in any manner imparts youth to the hair or recaptures the youthfulness of the hair, or that it is a vegetable compound; that "Nestle Shampoo" adds a natural sheen to the hair or that its use helps overcome or is a corrective or cure for dandruff or aids in stopping or checking falling hair, or that the use of it alone will minimize excessive loss of hair due to scurfed or sluggish scalp.

Odorono.—In February 1940 the Odo-Ro-No Company, Inc., New York, promised the Federal Trade Commission to cease representing in any manner "that the results to be obtained from the use of Odorono are unqualified, immediate and absolute, as implied by such words and phrases as 'no possibility,' 'insure,' 'stop,' 'instantly' and 'always.'" The Odo-Ro-No Company further agreed not to publish or cause to be published any testimonials containing representations contrary to the foregoing agreement.

Palmolive Soap.—This was advertised by the Colgate-Palmolive Peet Company, Jersey City, N. J., and its subsidiary, Kirkman and Son, Inc., New York, under certain claims to which the Federal Trade Commission objected. Among these were that the product contains special protective qualities all its own or not present in any other soaps; is composed wholly or in part of edible olive oil or of the grade of olive oil used for bathing new born babies; that the "soft, smooth complexions" of the Dionne quintuplets are directly the result of "Palmolive Soap," and that use of this soap will keep the skin young, thoroughly cleanse the pores or assist in any way toward nourishment of the skin. In July 1940 the concerns mentioned promised the Federal Trade Commission to discontinue the foregoing misrepresentations and also to cease advertising that persons purporting to be authorities, who have not professionally used and actually approved "Palmolive Soap" or other products, and whose names appear on published testimonial letters or endorsements thereof, have inferentially or otherwise based such testimonials or opinions on their own professional experience, use and controlled laboratory tests. Further they agreed to discontinue representing by use of the unqualified statement "Made with olive oil" as descriptive of "Palmolive" soap or shaving creams, or by assertions of like import, that the oil or fat content of such products is wholly or predominantly olive oil.

Raz-Mah.—In June 1940 the Armand S. Weill Co., Inc., Buffalo, an advertising agency, signed a stipulation with the Federal Trade Commission agreeing to cease representing in its advertisements for "Raz-Mah" that this product of Templetons, Inc., Buffalo, will almost instantly relieve sufferers from wheezy, difficult breathing, that hay fever victims will get speedy relief from sneezing, itching and excessive watery secretions in the nose and eyes; that coughs due to bronchial irritation will be quickly relieved, and that bronchial irritations will be prevented from developing into asthma. Previously, in October 1939, Templetons, Inc., likewise had promised the Federal Trade Commission to discontinue these misrepresentations in its advertising.

Schweizer Tee.—This is put out by a Robert J. Schwyn, trading also under the name Schweizer Tee. In March 1940 Schwyn promised the Federal Trade Commission to cease representing that his product is an effective treatment for diabetes, is prescribed or recommended by doctors, helps the organs to function normally, effects a reduction of sugar or makes a broader diet possible.

Sem-Pray Jo-Ve-Nay.—In April 1940 the Sempray Jovenay Company, Grand Rapids, Mich., stipulated with the Federal Trade Commission that it would cease representing that this product is a complete beauty treatment, will smooth away or remove lines from the skin, change the normal texture of the skin to make it finer, keep the skin young, serve as a competent treatment for blackheads and remove all traces of foreign matter from the pores. This may be the same product which used to be sold from Grand Rapids under the name Sempre Giovine by the Marietta Stanley Company and which the North Dakota Agricultural Experiment Station years ago reported to be apparently a mixture of some vegetable oil or cocoa butter, with beeswax or spermaceti, plus about 15 per cent of paraffin. That authority added to its report on the product the comment—"It is rather difficult to understand how paraffin, or beeswax, or spermaceti would not close up the pores; or, how anything in this preparation could be considered as 'nourishing the starved tissues,' or cleansing and opening the pores of the skin; or, what there is that could be expected to remove the blemishes that mar the features."

Vitamins Plus.—This product, put out by Vitamins Plus, Inc., New York, was advertised under a number of misrepresentations. Among these were that cloudy or lusterless eyes or lack of whiteness of the teeth are generally due to vitamin A deficiency; that vitamins are of significance in determining the duration of the time hair stays in curl, or makeup remains on the surface of the skin or nail polish adheres to the nails; that vitamin B will maintain or nourish brain tissue or will remove lactic acid from the blood stream and thereby eliminate fatigue, or is of value in cases of constipation or nervous disorders, except when and to the extent that such cases may be due to insufficient vitamin B; that foods customarily consumed have but a negligible amount of vitamin B; that vitamin E is known to be capable of preventing sterility or of promoting mental or physical vigor; that by use of "Vitamins Plus" a person may expect to have sparkling eyes, or gleaming or lustrous hair, or a lovely complexion, or that one may become active, gay, beautiful or charming, or live without a "let-up" or "let-down." In October 1940 Vitamins Plus, Inc., signed a stipulation with the Federal Trade Commission agreeing to discontinue the foregoing misrepresentations. Some editorial comment on this case appeared in THE JOURNAL, Nov. 9, 1940, page 1639, under the title "Nonplusing 'Vitamins Plus.'"

Zonite Products.—Three of these, "Zonite Ointment," "Zonite Liquid" and "Vaginal Suppositories (Zonitors)" were named in a stipulation entered into by the Zonite Products Corporation, New York, and the Federal Trade Commission in March 1940. In this the concern promised to discontinue certain misrepresentations. Among these were that the cause of menstrual distress is often due to the presence of germs, or that the problem of feminine hygiene is eliminated by the use of the company's products or that they are a competent treatment for leukorrhea; that "Zonite Liquid" has a soothing action on the membranes or may always be used without risk or that it can never injure delicate tissues; that its use assures freedom from grip, colds, coughs and other diseases of the respiratory system; that it is effective in combating the cause of pyorrhea, will control all dandruff or itchy scalp skin, end dandruff or itchy scalp, kill onion breath permanently; that the respondent's products are the only antiseptics which are nonpoisonous under similar conditions of use, and that either "Zonite Liquid" or "Zonite Ointment" is 100 per cent effective in preventing athlete's foot or will assure the user of immunity therefrom. Some years ago government chemists reported that the liquid Zonite consisted essentially of a solution of sodium hypochlorite yielding approximately 1 per cent of available chlorine.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, September 20, page 1037.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Oct. 7-8. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Medical.* Little Rock, Nov. 6-7. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 6. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Oct. 1. *Written.* Sacramento, Oct. 20-23. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * *Examination.* Denver, Oct. 7. *Endorsement.* Denver, Oct. 8-10. Sec., Dr. George R. Buck, 831 Republic Bldg., Denver.

CONNECTICUT:* *Medical. Examination.* Hartford, Nov. 11-12. *Endorsement.* Hartford, Nov. 25. Sec., Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 11-12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, Nov. 10-11. Sec., Dr. George C. Ruhland, 6150 East Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 24-25. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 14-15. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Jan. 12-15. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDAHO: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 14-16. Supt. of Registration, Mr. Lucien A. File, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 9-10. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 8-10. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 129 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 9-10. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 4-7. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: * Lansing, Oct. 15-17. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 203 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Oct. 21-23. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 29-31. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: *Reciprocity with oral examination,* Nov. 3. Final date for filing application is Oct. 20. Sec., Dr. Fred M. Anderson, 315 N. Carson St., Carson City.

NEW JERSEY: Trenton, Oct. 21-22. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NORTH CAROLINA: *Endorsement.* December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 6-9. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: * *Reciprocity.* Oklahoma City, Dec. 10. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Reciprocity.* Portland, Oct. 18. *Examination.* Portland, January. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Acting Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Oct. 2-3. Sec., Division of Examiners, Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 10-11. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 13-14. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TENNESSEE: Memphis, Oct. 1-2. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Austin, Nov. 17-19. Sec., Dr. T. J. Crowe, 918 Texas Bank Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 9-12. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Charleston, Nov. 17-19. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 13-15. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 6-7. Sec., Dr. M. C. Keith, State Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Oct. 11. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 6150 East Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 1. Final date for filing application is Oct. 17. Sec., Professor J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Oct. 14. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MINNESOTA: Minneapolis, Oct. 7-8. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 7-8. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Nov. 1. Final date for filing application is Oct. 15. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Nov. 19. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 5-6. Sec., Dr. G. M. Evans, Yankton.

Illinois April Report

The Illinois Department of Registration and Education reports the written examination for medical licensure (graduates of foreign schools given also a practical test) held in Chicago, April 1-3, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Fifty-nine candidates were examined, 51 of whom passed and 8 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1939)	77
Chicago Medical School		(1940) 76, (1941)	80
Northwestern University Medical School		(1939) (1940) 82,* 82, 84, (1941) 76, 81, 82,* 83, 84,* 87*	87,*
Rush Medical College		(1939) 75, 79,* 82, 84, (1940) 81, 83,* 83, 84, 84, 84	80,
University of Illinois College of Medicine		(1940) 81,* 81,* 81, 82, 83, 86, (1941) 85†	76,
University of Michigan Medical School		(1938)	84*
Cornell University Medical College		(1924)	80
Duke University School of Medicine		(1935)	84*
University of Pennsylvania School of Medicine		(1939)	83*
University of Wisconsin Medical School		(1939)	82
University of Toronto Faculty of Medicine		(1931)	86
University of Western Ontario Medical School		(1938)	90*
Medizinische Fakultät der Universität Wien		(1920) (1936) 75, 82, (1937) 75	76,
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1921)	78
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main		(1921)	79
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg		(1909), 76, (1915)	75
Regia Università di Napoli Facoltà di Medecina e Chirurgia		(1937)	78
Regia Università di Torino Facoltà di Medecina e Chirurgia		(1923)	81
Universiteit van Amsterdam Geneeskunde Faculteit		(1934)	76
Universität Bern Medizinische Fakultät		(1936)	77

School	FAILED	Year Grad.	Number Failed
Medizinische Fakultät der Universität Wien		(1921), (1922), (1924)	3
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1922)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1917)	1
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg		(1923)	1
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1922)	1
National University of Athens School of Medicine		(1938)	1

Twenty-four physicians were successful in the practical test for reciprocity and endorsement applicants held in Chicago, April 3. The following schools were represented:

School	PASSED	Year Grad.	Reciprocity with
Loyola University School of Medicine		(1938)	Penna.
Northwestern University Medical School		(1939)*	Wisconsin
Rush Medical College		(1935),* (1937)* (1935)*	Minnesota, Michigan
Indiana University School of Medicine		(1932), (1938)*	Indiana
Tulane University of Louisiana School of Medicine		(1928)	Louisiana
University of Michigan Medical School		(1936)	Michigan
University of Minnesota Medical School		(1926),* (1933)	Minnesota
St. Louis University School of Medicine		(1928)*	Missouri
Washington University School of Medicine		(1929), (1939)*	Missouri
University of Nebraska College of Medicine		(1930)*	Nebraska

University of Pennsylvania School of Medicine	(1924)	Penna.
University of Pittsburgh School of Medicine	(1926)	Penna.
Vanderbilt University School of Medicine	(1919)*	Tennessee
University of Texas School of Medicine	(1931)	Texas
Marquette University School of Medicine	(1935)	Wisconsin
University of Wisconsin Medical School	(1931)*	Wisconsin

School	PASSED	Year Grad.	Endorsement of
Yale University School of Medicine		(1938)	N. B. M. Ex.
Harvard Medical School		(1935)	N. B. M. Ex.
Washington University School of Medicine		(1928)	N. B. M. Ex.

* Licenses have not been issued.

† This applicant has completed four years' medical work and will receive the M.D. degree on completion of internship. License has not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Intoxication: Compelling Defendant to Give Specimen of Urine as Violative of Constitutional Provision Against Compulsory Self Incrimination.—The defendant killed a person, it was charged, in operating an automobile while intoxicated. He was arrested and shortly thereafter was compelled by police officers to submit to a series of tests to determine whether or not he was intoxicated. A specimen of his urine was taken for chemical examination. He was indicted for murder and at the subsequent trial the court permitted a chemist to testify that an analysis of the sample of the urine disclosed the presence of alcohol. A police officer was also permitted to testify that the other tests performed on the defendant indicated, in his opinion, that the defendant was intoxicated. The defendant was convicted and appealed to the court of criminal appeals of Texas.

The defendant contended that a constitutional right guaranteed by the Texas constitution—that no one accused of crime should be compelled to give evidence against himself—had been violated by the admission of the testimony of the chemist and the police officer. The rights intended to be protected by the constitutional provision referred to, said the court, are so sacred, and the pressure toward their relaxation so great when suspicion of guilt is strong and evidence is obscure, that it is the duty of courts liberally to construe the prohibitions in favor of personal rights and to refuse to permit any step tending toward their invasion. Such constitutional inhibitions are directed not merely to the giving of oral testimony but embrace as well the furnishing of evidence by other means than by word of mouth; the divulging, in short, of any fact that the accused has a right to hold secret. The evidence shows that the defendant was compelled by the police officers to submit to the tests desired by them and that he had therefore been compelled to give evidence against himself. The judgment of conviction was accordingly reversed and the cause remanded.—*Apodaca v. State, 146 S. W. (2d) 381 (Texas, 1941).*

Libel and Slander: False Charge that Physician Is Not Licensed Slanderous.—In connection with a claim of Mrs. Perkins for benefits under a policy of insurance, the plaintiff physician executed a certificate supplied by the insurance company. The insurance company rejected the claim, and one of its agents in explaining orally to the insured the reason for its action stated that it did so because the plaintiff physician was not licensed to practice medicine and surgery in that state. The physician, contending that he was licensed to practice medicine and surgery and that the statement by the agent to the contrary injured him, instituted an action for slander against the insurance company. From a judgment for the physician, the insurance company appealed to the Kansas City court of appeals, Missouri.

The plaintiff's complaint alleged that the untrue and defamatory statement had injured him both individually and as a physician. At the trial, however, he abandoned that charge of the complaint which alleged injury to him as a physician and the case was submitted to the jury only on the question of injury to the plaintiff's personal reputation and good name. The defendant contended that the defamatory statement was actionable from the mere fact of its utterance and without proof of special damage only as to injury to the physician in the practice of his profession and was not actionable with respect to the physician as a private individual unless there was a showing of special damages. Since the physician, the defendant argued, had abandoned the claim of slander as to his profession and since there was no proof that the allegedly slanderous statement had caused him any special damages in his capacity as a private individual, the judgment for the physician was unwarranted. The defendant cited in support of its contention *Boyce* v. *Wheeler*, 197 Mo. App. 295, 195 S. W. 84, which held that, with the exception of defamatory words touching one's fitness for or integrity in office, or which prejudice one in his trade, profession or business, oral words are not actionable without proof of special damage, unless they impute the commission of an indictable offense punishable by corporal punishment. But, said the appellate court, it is a misdemeanor, punishable by either or both corporal punishment and fine, in Missouri for one to act as a physician and surgeon or to hold himself out as authorized so to practice unless he possess a license so to do. The statement by the insurance agent that the plaintiff was not licensed to practice charged, in effect, that the plaintiff in executing the certificate in the capacity of a physician and surgeon had committed an indictable offense punishable by corporal punishment. If not true, the statement as to the plaintiff as an individual was therefore slanderous per se and actionable without proof of special damages. The evidence is clear that the statement was not true and that the plaintiff is licensed to practice. The judgment for the plaintiff was accordingly affirmed.—*Tincher v. National Life & Accident Ins. Co., 146 S. W. (2d) 663 (Mo., 1941).*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 19-23. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.

American Academy of Pediatrics, Boston, Oct. 8-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Clinical and Climatological Association, Skytop, Pa., Oct. 16-18. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Boston, Nov. 3-7. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Public Health Association, Atlantic City, N. J., Oct. 14-17. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Society of Tropical Medicine, St. Louis, Nov. 11-14. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.

Associated Anesthetists of the United States and Canada, Boston, Nov. 3-7. Dr. C. J. Wells, 1932 S. Salina St., Syracuse, N. Y., Secretary.

Association of Military Surgeons of the United States, Louisville, Ky., Oct. 29-Nov. 1. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.

Central Association of Obstetricians and Gynecologists, New Orleans, Oct. 2-4. Dr. William F. Mengert, 515 Newton Road, Iowa City, Secretary.

Clinical Orthopaedic Society, Cleveland and Akron, Ohio, Oct. 3-4. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Delaware, Medical Society of, Wilmington, Oct. 7-8. Dr. C. L. Munson, 1015 Washington St., Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Sept. 30-Oct. 2. Mr. Theodore Wiprud, 1718 M Street N.W., Washington, Secretary.

Inter-State Postgraduate Medical Association of North America, Minneapolis, Oct. 13-17. Dr. Tom B. Throckmorton, 406 Sixth Ave., Des Moines, Iowa, Secretary.

Kentucky State Medical Association, Louisville, Sept. 29-Oct. 3. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.

Mississippi Valley Medical Society, Cedar Rapids, Iowa, Oct. 1-3. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 27-31. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 6-9. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Medical Association, St. Louis, Nov. 10-13. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Minnesota Medical Association, Mankato, Sept. 29. Dr. Nelson W. Barker, 102 Second Ave., Rochester, Secretary.

Vermont State Medical Society, Burlington, Oct. 2-3. Dr. Benjamin F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Virginia, Medical Society of, Virginia Beach, Oct. 6-8. Miss A. V. Edwards, 1200 East Clay St., Richmond, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Huntington, Ind.

8:237-278 (July) 1941

Incidence and Diagnosis of Pancreatic Lithiasis: Review of Eighteen Cases. A. M. Snell and M. W. Comfort, Rochester, Minn.—p. 237.
Nutritional Problems as Related to National Defense. R. M. Wilder, Rochester, Minn.—p. 243.
Incidence of Regional Ileitis. C. W. Wirts Jr. and B. B. V. Lyon, Philadelphia.—p. 246.
Studies on Ascorbic Acid Deficiency in Gastric Diseases: Incidence, Diagnosis and Treatment. J. B. Ludden, J. Flexner and I. S. Wright, New York.—p. 249.
Uncommon Clinical Pictures in Suppurative Perianal Infections. M. Diamond and H. Laufman, Chicago.—p. 252.
Bacteriologic Examination of Stomach Contents in Pernicious Anemia. G. F. Dick, Chicago.—p. 255.
Perforation of Stomach with Flexible Gastroscope: Case Report. L. Schiff and N. Shapiro, Cincinnati.—p. 260.
Relation of Nutrition to Gastric Function: II. Effect of Vitamin C Deficiency. J. H. Roe, J. M. Hall and Helen M. Dyer, Washington, D. C.—p. 261.
Production of Intestinal Lesions by Feeding Karaya Gum and Other Materials to Rats. F. Hoelzel, Esther Da Costa and A. J. Carlson, Chicago.—p. 266.
Depression of Gastric Motility by Insulin. H. Necheles, W. H. Olson and R. Morris, Chicago.—p. 270.

American J. Obstetrics and Gynecology, St. Louis

42:1-192 (July) 1941. **Partial Index**

Studies on Nucleated Red Cell Count in Chorionic Capillaries and Cord Blood of Various Ages of Pregnancy. G. W. Anderson, Buffalo.—p. 1.
Intrauterine Respiration in Relation to Development of Fetal Lung, with Report of Two Unusual Anomalies of Respiratory System. Edith L. Potter and G. P. Bohlender, Chicago.—p. 14.
Supravaginal and Total Hysterectomy. R. L. Pearse, Durham, N. C.—p. 22.
Study of 150 Consecutive Cases of Ectopic Pregnancy. H. H. Ware Jr. and W. C. Winn, Richmond, Va.—p. 33.
Placenta Bilobata. R. Torpin, Augusta, Ga., and B. F. Hart, Winter Park, Fla.—p. 38.
Oral Progestin (Anhydrohydroxyprogesterone) in Treatment of Dysmenorrhea. R. B. Greenblatt, E. McCall and R. Torpin, Augusta, Ga.—p. 50.
Sterilization in Puerperium. W. N. Thornton Jr. and T. J. Williams, University, Va.—p. 54.
Electrometric Study of Uterine Activity: Preliminary Report. L. Langman, New York, and H. S. Burr, New Haven, Conn.—p. 59.
Bacteriologic Characteristics of Anaerobic Streptococci Recovered from Postpartum Patients, with Special Reference to Initiation of Infection by These Organisms. M. L. Stone, New York.—p. 68.
Ruptured Uterus. H. F. Burkons, Cleveland.—p. 75.
Treatment of Menstrual Disorders with Pregnant Mare's Serum. W. H. Vogt Jr. and D. L. Sexton, St. Louis.—p. 81.
Effect of Oral Administration of Alpha Estradiol and Pregneninolone on Human Castrate Uterus. T. Neustaedter, New York.—p. 86.
Estrin Potency and Basal Metabolism. Mary E. Collett, Faith W. Reed, Leabelle Isaac, Sylvia Rouse and Eleanor Yeakel, Cleveland.—p. 93.
*Incidence of Hypertension After Toxemias of Pregnancy. T. J. Williams, University, Va.; H. G. Nix, Tampa, Fla., and C. H. Mauzy, Winston-Salem, N. C.—p. 98.

Hypertension After Toxemias of Pregnancy.—Williams and his collaborators, investigating the connection between toxemia of pregnancy and hypertension, were able to follow up 224 cases in which toxemia had occurred from one to thirteen years previously. Using a systolic-diastolic standard of 140/90 mm. of mercury for determining blood pressure, they found that definite hypertension existed in 104 (46.5 per cent). The age and parity of the patient at the time of the toxemia seemed to be the most significant factors in the incidence of subsequent hypertension. Approximately 80 per cent of those more than 35 years of age had hypertension. Primiparas had a 26 per cent incidence as compared with a 66 per cent incidence in multiparous patients. Later hypertension was twice as great in patients who had had toxemia and gave birth subsequently as in those who did not repeat the pregnancy. Except in cases of previously known chronic nephritis or essential hypertension, the severity and type of toxemia seemed to have no special significance. The elevation of the systolic and diastolic pressures at the time of the toxemia likewise seemed to play only a small part in the incidence of later hypertension, except at very high levels. Except in cases of previously known nephritis and hypertension no definite criteria exist for predicting the possibility of permanent hypertension following the toxemia. If hypertension persists in patients who have had toxemia, additional pregnancies should be undertaken with considerable reluctance and with a very careful antepartum regimen. About half of the patients will have no persisting hypertension and may go through subsequent pregnancies without ill effects or permanent damage.

American Journal of Physiology, Baltimore

133:503-804 (July) 1941. **Partial Index**

Relative Effects of Desoxycorticosterone and Whole Corticoadrenal Extract on Adrenal Insufficiency. S. W. Britton and R. F. Kline, Charlottesville, Va.—p. 503.
Antagonistic Action of Desoxycorticosterone and Postpituitary Extract on Chloride and Water Balance. E. L. Corey and S. W. Britton, with technical assistance of R. F. Kline and C. R. French, Charlottesville, Va.—p. 511.
Influence of Gelatin Ingestion on Creatinine-Creatine Excretion of Normal Men. D. B. Dill and S. M. Horvath, with technical assistance of F. Consolazio, Boston.—p. 520.
Environmental Temperatures and Thiamine Requirements. C. A. Mills, Cincinnati.—p. 525.
Effect of Emotion, Sham Rage and Hypothalamic Stimulation on Vago-Insulin System. E. Gellhorn, R. Cortell and J. Feldman, Chicago.—p. 532.
Composition of Gastric Juice as Function of Rate of Secretion. J. S. Gray and G. R. Bucher, Chicago.—p. 542.
Resistance of Central Synaptic Conduction to Asphyxiation. A. Van Harreveld, Pasadena, Calif.—p. 572.
Age Changes and Sex Differences in Alveolar Carbon Dioxide Tension. N. W. Shock, Berkeley, Calif.—p. 610.
Ineffectiveness of Vagal Stimulation on Ventricular Fibrillation in Dogs. C. J. Wiggers, Cleveland.—p. 634.

Annals of Internal Medicine, Lancaster, Pa.

15:1-164 (July) 1941

Special Medical Service in Defense Program. C. S. Stephenson, Washington, D. C.—p. 1.
The Recruit's First Year. P. S. Madigan, Washington, D. C.—p. 18.
*Silent or Atypical Coronary Occlusion. W. D. Stroud and J. A. Wagner, Philadelphia.—p. 25.
*Effect of Thiamine on Residual Neural Disturbances of Treated Pernicious Anemia. J. C. Zillhardt, Binghamton, N. Y.; K. MacLean, Vancouver, B. C., and W. P. Murphy, Boston.—p. 33.
Effect of Vitamin B Complex on Residual Neural Disturbances of Treated Pernicious Anemia. J. C. Zillhardt, Binghamton, N. Y.; Isabel Howard and W. P. Murphy, Boston.—p. 44.
*Syndrome of Multiple Vitamin Deficiency. V. P. Sydenstricker, Augusta, Ga.—p. 45.
Glucose-Sulfapyridine: Experimental and Clinical Studies. H. K. Ensworth, J. Liebmann, M. C. Lockhart and N. Plummer, New York.—p. 52.
*Syndrome of Upper Esophageal Stenosis. M. R. Camiel and L. Loewe, Brooklyn.—p. 63.
Development of Plasma Preparations for Transfusions. M. M. Strumia and J. J. McGraw, Philadelphia.—p. 80.
Toxic Depression of Myeloid Elements Following Therapy with Sulfonamides: Report of Eight Cases. S. S. Rinkoff and M. Spring, Bronx, N. Y.—p. 89.
Responsibility of Hospital Staff in Graduate Medical Education. F. J. Sladen, Detroit.—p. 108.

Silent or Atypical Coronary Occlusion.—Stroud and Wagner discuss painless coronary occlusion and myocardial infarction on the basis of 49 cases of proved myocardiac infarction in which 13 were without pain. The authors point out the difficulty of explaining painless infarction. Swallowing, choking, gagging or dyspnea may be pain equivalents. Therapeutically it is of prime importance to be cognizant of the possibility of absence of pain in the presence of coronary pathologic changes. Vague symptoms of weakness in patients with hypertension or the onset of increased dyspnea, together with progressive failure in patients with previous mild failure, should make one alert to this serious condition. Rest in bed and serial electrocardiographic check-ups are highly desirable.

Patients with the typical pain of coronary insufficiency but with no other suggestive clinical findings, even in the absence of changing T waves in the electrocardiograms, must be considered as possible cases of coronary occlusion without myocardial infarction and be treated accordingly; namely, with total rest in bed for a week or ten days. Clinical judgment is of much greater importance in these cases than the electrocardiograms.

Effect of Vitamin B_1 on Residual Neural Disturbances.—Zillhardt and his associates, on the basis of 19 cases about equally divided as to sex, report the temporary beneficial effects of vitamin B_1 on residual neural signs and symptoms of pernicious anemia which seemed stationary in spite of persistent and intensive anti-pernicious anemia therapy. The principal improvements noted in physical examinations were in temperature sense, pain sense and in two point discrimination and occurred only during the first two months of an experimental period of four months. Three thousand international units of vitamin B_1 intravenously was found to be more effective than 900 international units given orally twice a day. The many variables involved in attempting to quantitate neurologic symptoms and signs were carefully considered by the authors. Since the intramuscular use of vitamin B_1 seemed to benefit most of the patients, they believe that with such treatment the efficiency of undamaged neural tissue might become increased or existing reversible peripheral neuritic changes become improved or, as a result of the possible improvement of the patient's general health, neural function might become enhanced.

Syndrome of Multiple Vitamin Deficiency.—According to Sydenstricker, clinical observations and therapeutic tests furnish presumptive proof that the presence of signs of any one avitaminosis is indicative of multiple vitamin deficiency. In the B group, treatment with the single vitamin, indicated by predominant signs, may result in the rapid development of severe manifestations of other deficiencies. In the majority of cases, signs of multiple deficiency can be found without difficulty. A high protein, high caloric diet, containing adequate amounts of the protective foods, is the basis of all treatment of deficiency disease. The components of such a diet, the manner and the frequency of ingestion can be adapted to the needs of the individual case. In addition to relatively great amounts of the particular vitamin which is lacking, all other available vitamins should be given in amounts representing at least four or five times the normal daily requirements. Vitamins B_1 and B_2 frequently produce almost immediate effects when given intramuscularly or intravenously after failure on peroral administration. It may be wise to give these vitamins by injection to patients who are urgently ill.

Upper Esophageal Stenosis.—Camiel and Loewe point out that esophageal neoplasms of the upper third portion of the esophagus are characterized by paralysis of one or both vocal cords, by dysphagia, by aspiration of ingesta into the tracheobronchial tree, by pulmonary complications due to aspiration and by frequent occurrence of clubbed fingers (more than one third in this series presented clubbed fingers). Twelve of the 13 patients showing involvement of the uppermost third of the esophagus died of aspiration bronchopneumonia. Their average age was more than 58 years. The incidence of pulmonary complications fell perceptibly when the esophageal lesions lay distal to its uppermost third. The esophageal lesions were mainly neoplastic, though neoplasia does not appear to be an absolute prerequisite for this syndrome. Neither need the recurrent laryngeal nerves be involved. Neoplastic stenosis in the upper esophagus, however, creates an anatomic and physiologic pathologic change which makes aspiration almost inevitable. Diagnosis of pulmonary lesions, paralysis of the vocal cords or clubbed fingers, in the absence of a known primary, should point strongly to the esophagus or its neighboring structures as the offender. Strangulation following attempts at swallowing may be pathognomonic not only of esophagotracheal or bronchial fistula but of the syndrome under discussion. Fluoroscopic barium sulfate study of the act of swallowing should be routinely employed in the examination of esophageal lesions.

Archives of Dermatology and Syphilology, Chicago

44:147-320 (Aug.) 1941

Tularemia. T. K. Lawless, Chicago.—p. 147.
Histology of Neurodermatitis. R. C. MacCardle, M. F. Engman Jr. and M. F. Engman Sr., St. Louis.—p. 161.
Skin Reactions: XII. Patterns Produced in Skin by Electrophoresis of Dyes. H. A. Abramson and Margery G. Engel, New York.—p. 190.
Ordinary Baldness. H. Rattner, Chicago.—p. 201.
Squamous Cell Epithelioma Associated with Senile Keratosis on Leg of Negro: Report of Case. G. A. Spencer, New York.—p. 214.
Contact Dermatitis Due to Underwear: Observations in Fourteen Cases, with Summary of Efforts to Discover Cause. A. W. Neilson and A. J. Reiches, St. Louis.—p. 218.
Topical Treatment with Sulfathiazole. W. M. Sams and L. Capland, Miami, Fla.—p. 226.
Cornu Cutaneum. D. W. Montgomery, San Francisco.—p. 231.
Sulfanilamide and Allied Compounds: Their Value and Limitations in Dermatology. F. C. Combes and O. Cañizares, New York.—p. 236.
Androgen and Xanthomatoses. T. Cornbleet and Broda Barnes, Chicago.—p. 248.
Gastroscopic Observations in Rosacea. B. Usher, Montreal, Canada.—p. 251.

Archives of Pathology, Chicago

32:169-314 (Aug.) 1941

*Adenomatous Hyperplasia of Adrenal Cortex Associated with Essential Hypertension. J. F. Rinehart, San Francisco; O. O. Williams, Phoenix, Ariz., and W. S. Cappeller, San Francisco.—p. 169.
Incidence and Localization of Coronary Artery Occlusions. M. J. Schlesinger and P. M. Zoll, Boston.—p. 178.
Distribution of Acid Phosphatase in Tissues Under Normal and Under Pathologic Conditions. G. Gomori, Chicago.—p. 189.
Osteitis Fibrosa Localisata: Experimental Study. J. L. Bremer, Boston.—p. 200.
Effect of Cellophane Perinephritis on Granular Cells of Juxtaglomerular Apparatus. F. W. Dunihue, Burlington, Vt.—p. 211.
Teratomas of Neck in Newborn: Report of Case with Autopsy. F. D. Chapman, Boston.—p. 217.
Psammomatous Dural Endothelioma (Meningioma) with Pulmonary Metastasis. H. N. Jurow, Cincinnati.—p. 222.
Hemolytic Reactions Following Transfusions of Blood of Homologous Group: II. Further Observations on Role of Property Rh, Particularly in Cases Without Demonstrable Isoantibodies. A. S. Wiener, Brooklyn.—p. 227.
Anomalies of Circle of Willis in Relation to Cerebral Softening. G. H. Fetterman, Pittsburgh, and T. J. Moran, Mayview, Pa.—p. 251.
Histologic Demonstration of Vitamin A in Tumors. H. Popper and A. B. Ragins, Chicago.—p. 258.
Constitution and Related Factors in Resistance to Tuberculosis. E. R. Long, Philadelphia.—p. 286.

Hyperplasia and Essential Hypertension.—Rinehart and his associates made an anatomic study of the adrenal glands removed at necropsy from 26 patients with hypertension, 18 with heart and valvular or pulmonary disease, 4 with glomerular nephritis and 9 with chronic pyelonephritis. The alterations found were compared with those in the adrenal glands of 100 nonhypertensive patients. They found that nodular or adenomatous hyperplasia of the adrenal cortex was usually associated with essential hypertension. The cells were hyperplastic and many showed a high lipoid content. Similar changes were infrequent in the adrenal glands of nonhypertensive patients. The mean weights of the adrenal glands of the 100, 18, 4, 9 and 26 patients were 11.2, 10.6, 13.1, 13.3 and 15.4 Gm. respectively. The adrenal glands of the 18 patients with cardiac hypertrophy due to valvular or pulmonary disease did not differ in size or microscopic appearance from the control group. In 1 of the 4 with glomerular nephritis there was mild adenomatous hyperplasia of the cortex and increased lipoid, and in the other 3 the adrenal glands appeared essentially normal. In the adrenal glands of 2 of the 9 patients with chronic pyelonephritis there was well defined adenomatous hyperplasia of the cortex comparable to that seen in essential hypertension, and in 6 there was a mild hyperplasia or slight cortical thickening. This suggests that there is some stimulation of the adrenal cortex in renal hypertension. The authors suggest that hypersecretion of the adrenal cortex may in some cases be a factor in the genesis of essential hypertension. While the hyperplasia of the adrenal cortex occurring commonly in essential hypertension may also be a secondary effect, it is possible that "primary" hyperplasia and hypersecretion of the adrenal cortex might induce hypertension. The hyperplasia of the adrenal cortex in essential hypertension is almost as definite as that of the thyroid in exophthalmic goiter.

California and Western Medicine, San Francisco

55:1-54 (July) 1941

Peyronie's Disease or Fibrous Cavernositis: Some Observations. E. W. Beach, Sacramento.—p. 7.
Skin Reactions Produced by 200 Kilovolt and 1,000 Kilovolt Radiations: Comparison. R. S. Stone and J. M. Robinson, San Francisco.—p. 11.
Use of "Blood Bank" in Transfusions. N. Evans, Los Angeles.—p. 14.
Relief of Pain About Head and Neck. H. A. Brown, San Francisco.—p. 17.
Appendical Calculus: Report of Case. F. R. Guido, Visalia.—p. 19.
Operative Supportive Treatment of Varicose Ulcers. R. S. Sherman and M. L. Montgomery, San Francisco.—p. 22.
Role of Cauda Equina Lesions in Production of Constipation and Urinary Retention. W. C. Boeck, Los Angeles.—p. 24.
Choice in Sulfonamide Drugs. L. A. Rantz and W. C. Cutting, San Francisco.—p. 29.
Public Health Activities and Responsibilities. E. Belt, Los Angeles.—p. 30.
Role of the Doctor of Medicine in the Life and Health of the American Citizen. Ruth Kliewer, Bakersfield.—p. 32.

Delaware State Medical Journal, Wilmington

13:85-142 (June) 1941

Development of the Delaware State Hospital. M. A. Tarumianz, Farnhurst.—p. 85.
Male Migraine Treated with Female Sex Hormone. C. W. Dunn, Philadelphia.—p. 89.
Electric Shock Therapy. P. F. Elfeld, Farnhurst.—p. 95.
Chronic Myelogenous Leukemia. J. W. Ballard, Farnhurst.—p. 97.
Establishing Real Identity of Patient Following Metrazol Shock. F. Paul, Farnhurst.—p. 98.
Psychotherapy: Case Presentation from Mental Hygiene Clinic to Illustrate Treatment Methods. M. L. Wadsworth, Farnhurst.—p. 100.
Loss of Personal Identity (Amnesia) and Its Role in Organic Syndromes. G. J. Gordon and B. G. Lawrence, Farnhurst.—p. 106.
Anorexia Mentalis. M. Zimbler, Farnhurst.—p. 112.
Myasthenia Gravis: Case Report. E. Kelemen, Farnhurst.—p. 117.
Vitamin E. G. Bieringer, Farnhurst.—p. 119.
Meaning of Functional Disorders. F. A. Freyhan, Farnhurst.—p. 122.
Treatment of Perforation of Hard Palate in the Edentulous Mouth. W. H. Norris; J. A. Wiener and L. C. Harris, Farnhurst.—p. 125.

Journal of Aviation Medicine, St. Paul

12:113-180 (June) 1941

Effects of Reduced Atmospheric Pressures on Electroencephalogram. R. S. Lyman, W. A. Carlson and O. O. Benson Jr., Dayton, Ohio.—p. 115.
*Necessity of Emergency Oxygen Unit for Use in Parachute Escapes at High Altitudes. W. M. Boothby, W. R. Lovelace and H. B. Burchell, Rochester, Minn.—p. 126.
Effect of Anoxia on Heart—Influence of Exercise and Effect of Acute Anoxia at Rest. E. J. Van Liere, Morgantown, W. Va.—p. 131.
Improved Technic for Applying Electrode Jelly. R. Greene, Coral Gables, Fla.—p. 135.
Development of Substratosphere Flying. D. W. Tomlinson, Kansas City, Mo.—p. 136.
Review of Modern and Recent Developments in Science of Ophthalmology. E. C. Ellett, Memphis, Tenn.—p. 144.
Methods in Aerobiology. O. C. Durham, North Chicago, Ill.—p. 153.
Maneuver for Relief of Acute Aero-Otitis Media. H. Lamport, New York.—p. 163.
Ear Conditions in Pilots and Radio Operators. H. B. Stauffer, Jefferson City, Mo.—p. 169.

Emergency Parachute Oxygen Unit at High Altitudes.—Boothby and his associates report a test experiment in a low pressure chamber, at a barometric pressure corresponding to 35,000 feet (11 kilometers), in which an aviator became unconscious within thirty-five to forty seconds after his oxygen supply was stopped, while he was simulating preparations to bail out. His last act before becoming unconscious was to start the emergency oxygen supply. He did this too late, as he immediately "passed out" and the mouthpiece fell out of his mouth. The electrocardiograms which accompanied the entire experiment merely indicated that the cardiac rate had increased to 166 during the period of unconsciousness. This cardiac rate corresponds to about the limit at which cardiac output is probably maintained, on the basis of observations in patients with paroxysmal tachycardia. The authors conclude that in altitudes in excess of 25,000 feet (7.6 kilometers) the aviator has no time to lose and must start his emergency oxygen supply immediately. If he does not do this first, it will be too late. All other procedures for bailing out must be deferred until after oxygen is started. The emergency parachute oxygen apparatus must therefore be in place for instant use whenever high altitude flights are undertaken.

Journal of Infectious Diseases, Chicago

68:193-302 (May-June) 1941

Experimental Infection of Rabbits with Duval's Chromogenic Acid-Fast Bacillus from Human Leprosy. W. L. Loving, New Orleans.—p. 193.
Study of Living Virus of Infectious Myxoma of Rabbits by High Power Microscopy. Rachel E. Hoffstadt and Dorothy V. Omundson, Seattle.—p. 207.
Cultivation of Virus of Infectious Myxoma on Chorioallantoic Membrane of Developing Duck Embryo. Rachel E. Hoffstadt, Dorothy V. Omundson and P. Donaldson, Seattle.—p. 213.
Additional Growth Factor Needed by Some Hemolytic Streptococci. A. Bass, S. Berkman and F. Saunders, Chicago.—p. 220.
Precipitin Formation in Guinea Pig. Charlotte A. Colwell and G. P. Youmans, Chicago.—p. 226.
Dissociative Aspects of Bacteriostatic Action of Sulfonamide Compounds. Ruth A. McKinney and R. R. Mellon, Pittsburgh.—p. 233.
Influence of Sulfanilamide on Mucoid and Smooth-Phase Cultures of Hemolytic Streptococci in Vitro. P. Hadley and Faith P. Hadley, Pittsburgh.—p. 246.
Variation in Peroxide Production by Beta Hemolytic Streptococci. Faith P. Hadley, P. Hadley and W. W. Leathen, Pittsburgh.—p. 264.
Action of Sulfanilamide on Hemolytic Streptococci Lancefield Groups A and D in Growth Promoting and Non-Growth Promoting Mediums. E. Neter, Buffalo.—p. 278.
Nature of Eimeria Nieschulzi Growth Promoting Potency of Feeding Stuffs: II. Vitamins B_1 and B_6. E. R. Becker and R. I. Dilworth, Ames, Iowa.—p. 285.
In Vitro Test for Chemotherapeutic Agents Used in Subacute Bacterial Endocarditis. M. H. Uhley and L. N. Katz, Chicago.—p. 291.

Journal of Pediatrics, St. Louis

19:1-146 (July) 1941

Hemorrhagic Disease of Newborn: Report of 358 Cases. L. Snedeker, Boston.—p. 1.
*Clinical Studies on Harmlessness of and Tuberculin Reactivity Following BCG Vaccination by Multiple Puncture Method. S. R. Rosenthal and I. S. Neiman, Chicago.—p. 16.
Diabetic Children in Nondiabetic Camps. W. E. Nelson, Philadelphia.—p. 25.
Sickle Cell Anemia Complicated by Acute Rheumatic Heart Disease and Massive Cerebral Hemorrhage: Report of Case. D. W. Walker and J. P. Murphy, New Haven, Conn.—p. 28.
Serum Phosphatase in Infantile Scurvy. H. Shwachman, Boston.—p. 38.
*Pathology of Mumps Encephalitis: Report of Fatal Case. W. L. Donohue, Toronto, Canada.—p. 42.
Bacillus Morgani, Type 1, in Enterocolitis of Infants. E. Neter and N. C. Bender, Buffalo.—p. 53.
*Gonococcic Conjunctivitis in Children: Comparison of Treatment with Sulfanilamide and Sulfapyridine, with Note on Sulfathiazole. L. K. Sweet, Washington, D. C.—p. 60.
Treatment of Gonococcic Vulvovaginitis in Children: Report of Eighteen Cases Treated by Implantation of Estradiol Benzoate. J. W. Holmes, J. A. Jones, N. H. Einhorn and L. A. Wikler, Philadelphia.—p. 70.
*Value of Sulfanilamide and Scarlet Fever Antitoxin in Treatment of Scarlet Fever. M. B. Gordon, N. H. Solomon and S. F. Pearlman, Brooklyn.—p. 76.
Ehlers-Danlos Syndrome with Disturbance of Creatine Metabolism: Report of Case. G. E. Pittinos, Staten Island, N. Y.—p. 85.
Vacuum Seal for Preservation of Feeding Formulas. W. V. Consolazio, Boston.—p. 90.
The Timid, Dependent Child. J. H. Conn, Baltimore.—p. 91.

Harmlessness of BCG Vaccination.—Rosenthal and Neiman employed the multiple puncture or intradermal method for BCG vaccination of 675 newborn infants. The children were followed for from three to thirty-nine months and there were no ill effects attributable to the vaccine. Regardless of the method used, no child reacted positively before ten days, about half reacted at from fourteen to sixteen days and practically all reacted after twenty-three days. The uniformity of results suggests that only a few living organisms are required to produce the desired effect or that the newborn infant has a relative insensitivity to tuberculin. There were 191 infants vaccinated by the intradermal method, 484 by the multiple puncture method and there were 698 control children. Of the 675 vaccinated children between 3 and 39 months of age 7 died, and of the 698 control infants 11 died. This indicates that tuberculin vaccination is harmless. Of 258 newborn infants vaccinated on the third to the tenth day of life by the multiple puncture method and tuberculin tested within the following fifty-four days, 14 per cent reacted to old tuberculin at from eleven to thirteen days, 47.7 per cent within fourteen to sixteen days, 96.6 per cent between twenty-three and thirty-one days and 98 per cent between thirty-two and fifty-four days. The reactivity to one vaccination by the multiple puncture method was 99.7 per cent at three to seven months, 99.6 per cent at eight to thirteen months, 97.5 per cent at fourteen to twenty-one months, 93.4

per cent at twenty to twenty-seven months, 84.8 per cent at eight to thirty-three months and 78.8 per cent at thirty-four to thirty-nine months. The reactions to tuberculin of the nonvaccinated infants living and studied under similar conditions was 0 per cent at three to seven months, 1.9 per cent at eight to thirteen months, 5.8 per cent at fourteen to twenty-one months, 8.5 per cent at twenty-two to twenty-seven months, 11.6 per cent at twenty-eight to thirty-three months and 19.2 per cent at thirty-four to thirty-nine months. A comparison of the multiple puncture and intradermal methods of vaccination revealed that the former was simpler in application and that it yielded fewer complications. The reactivities to tuberculin following the two methods were comparable.

Mumps Encephalitis.—Donohue reviews the micropathologic picture of mumps encephalitis as it is reported in the literature, finds that the reports do not follow a set pattern and that the changes described by Bien and Wegelin are similar to those which he found in his case. He believes that these 2 instances are the only ones in which the micropathologic changes are adequately described and in which there can be no doubt that encephalitis complicated mumps. The lesions in his case, although fundamentally identical with those found in the central nervous system of the postinfection encephalitides following other diseases (smallpox, chickenpox, measles and vaccination), were not as severe. The fundamental lesion was a perivascular demyelinization. If the lesions had not been so widespread or if pulmonary complications had not been present, recovery might have taken place. No virus studies were done on the tissues obtained.

Gonococcic Conjunctivitis in Children.—Sweet treated 59 patients having gonorrheal conjunctivitis with sulfanilamide, sulfapyridine or both. Since 1941 3 patients (respectively 10 years, 3 days and 2 days old) with gonorrheal conjunctivitis were treated with sulfathiazole. In each instance the ocular condition improved remarkably within twenty-four hours after therapy was begun. Smears free from gonococci were obtained from the eye discharges after one, six and three days, respectively. There were no toxic manifestations and there were no bacterial complications. Of 30 patients treated with sulfanilamide the smears of 24 were negative for gonococci within one to six days following therapy. Thirty-three patients, including the 4 who failed to respond to sulfanilamide, received sulfapyridine and 31 of them were cured (recovered) within from one to twelve days. Among these 31 were 3 of the patients who had not responded to sulfanilamide therapy. Only one corneal ulcer developed; this was in a patient on sulfanilamide therapy. Reports on more than 45 cases of gonorrheal conjunctivitis treated with sulfapyridine collected from the literature show the results to be comparable to those obtained by the author.

Sulfanilamide and Scarlet Fever Antitoxin.—According to Gordon and his associates, from February through May 1940 680 patients with scarlet fever were treated at the Kingston Avenue Hospital. The patients were mainly from the lower economic strata and were isolated for at least twenty-one days from the onset of the disease. Of 439 patients with a mild picture 294 were used as controls and 145 received sulfanilamide (0.065 Gm. per pound of body weight a day divided into six equal doses). The initial dose of the drug was one half of the estimated daily dose. The total febrile period was around five days in the two groups. The difference in isolation period, twenty-four and twenty-five hundredths days for the control group as compared with twenty-two and eighty-seven hundredths days for the treated group, is significant. The percentage of complications for the control patients was 33⅓ as against 13.1 per cent in the treated group. The incidence of otitis media was 9.3 per cent in controls and 2.07 per cent in treated cases. The results for the 238 patients with moderate involvement (fever, toxicity and complications) closely parallel those obtained in the mild group; 13 were controls, 65 were given scarlet fever antitoxin, 54 sulfanilamide and 46 the antitoxin and the drug. The total febrile periods were approximately equal in all groups, but slightly longer in the control group and shortest in the scarlet fever antitoxin group. The isolation periods were approximately the same in the treated groups (twenty-five and five-tenths days) but were appreciably greater in the control group (twenty-nine and seven-tenths days). The total incidence of complications was definitely diminished in all treated groups; the greatest decrease was among those receiving sulfanilamide. The incidence of complications in the group treated with sulfanilamide was 24.1 per cent, with scarlet fever antitoxin and sulfanilamide 23.8 per cent, with scarlet fever antitoxin 41.5 per cent and for the control group 60.3 per cent. The incidence of otitic complications in the sulfanilamide-treated groups (7.4 and 6.5 per cent) was approximately half that found in the other two groups (12.3 and 13.8 per cent). The incidence of toxic manifestations from sulfanilamide was 20 per cent, 71 per cent of which were cutaneous morbilliform eruptions, 57 per cent of which appeared on the tenth day of chemotherapy. Only 4 of the 111 patients receiving scarlet fever antitoxin exhibited (mild) serum disease.

Maine Medical Association Journal, Portland

32:161-186 (July) 1941

Medical Analysis of Second Series of 100 Operated Surgical Diabetics. E. R. Blaisdell, Portland.—p. 168.
"On Nature of Psychoses." M. Marquardt, Augusta.—p. 173.

Michigan State Medical Society Journal, Muskegon

40:489-568 (July) 1941

Preoperative Preparation of Patient. A. L. Lockwood, Toronto, Canada.—p. 509.
Diagnosis of Coronary Occlusion. J. B. Carter, Chicago.—p. 515.
Carcinoma of Prostate. J. K. Ormond and B. Brush, Detroit.—p. 525.
Arthritis: Contraindication for Typhoid Vaccine Fever Therapy. W. J. Yott, Detroit.—p. 528.
Massive Arsenotherapy in Early Syphilis. L. W. Shaffer, Detroit.—p. 529.
Fractures of Neck of Femur: Technic for Rapid Nailing: Preliminary Report. A. D. La Ferté, Detroit.—p. 531.
Postpartum Sterilization. W. G. Birch, Sault Ste. Marie.—p. 535.

New England Journal of Medicine, Boston

225:1-50 (July 3) 1941

Mental Hygiene Clinics. S. Gagnon, Boston.—p. 1.
*So-Called "Mesentericoparietal Hernia": Report of Case. H. W. Hudson Jr., Brookline, Mass.—p. 4.
Gallstones in Patients Under 30 Years of Age. C. Bearse, Boston.—p. 8.

Mesentericoparietal Hernia.—Hudson describes a rare case of incarceration of the small intestine due to a congenital defect in the mesocolon in an 8 year old schoolboy and its successful surgical management. The anomaly is embryologically explained, its clinical and anatomic relations to other forms of faulty rotation and attachment of the colon are discussed and additional evidence is presented for the evolutionary basis of such anomalies; namely, imprisonment of essentially all of the intestine arising from the midgut, the defective mesenteric attachments and the coexistent volvulus of the small intestine. The designation of "hernia" is retained, although the anomaly is not a hernia in the usual sense.

225:51-90 (July 10) 1941

Polyneuritis with Facial Diplegia: Clinical Study. F. M. Forster, Madelaine Brown and H. H. Merritt, Boston.—p. 51.
*Carcinoma of Female Breast: Interval Report on Results of Treatment. S. C. Graves, Brookline, Mass.—p. 57.
Law and Mental Disease. W. C. Crossley, Fall River, Mass.—p. 61.
Comparative Costs of Vitamin C in Fresh and Commercially Canned Fruit and Vegetable Juices. A. D. Holmes, Madeline G. Pigott and F. Tripp, Stoneham, Mass.—p. 68.
Pharmacology. G. P. Grabfield, Boston.—p. 73.

225:91-124 (July 17) 1941

Nonarterial Disorders Simulating Disease of Peripheral Arteries. E. A. Edwards, Boston.—p. 91.
What Sensible Living and Natural Recovery Can Do for the Cardiac Patient. H. B. Levine and P. D. White, Boston.—p. 101.
Treatment of Hand Injuries. S. L. Koch, Chicago.—p. 105.
Kidney Disease. R. Fitz, Boston.—p. 109.

Carcinoma of Female Breast.—According to Graves, 36.7 per cent of 376 consecutive patients treated for carcinoma of the breast in a survey covering thirty-five years were known to be alive five years after treatment. Radical mastectomy was performed in 284 cases. Sixty per cent of the patients without axillary metastases were living at the end of five

years, but only 24 per cent of those with axillary involvement. Mastectomy should be used only in really bad operative cases, since it is impossible to rule out axillary metastases preoperatively. The prognosis for carcinoma of the breast is improving as the result of earlier admissions and prophylactic irradiation. Better results were obtained when irradiation with roentgen rays was given than when it was withheld. Prophylactic irradiation seems to benefit particularly cases of highly malignant tumors with no apparent axillary involvement but should be used routinely rather than only in advanced cases. Roentgen irradiation or radium therapy was seen to retard the tumor or cause its disappearance in about one third of the patients with recurrent disease. It seldom effects a five year cure. Cancer of the breast is not infrequent in young women though primarily a disease of elderly persons. The most significant factor at operation is the extent of the disease rather than the degree of malignancy. The author states that there is no criterion of absolute cure for mammary carcinoma. Many patients die of the disease fifteen or more years after operation.

Surgery, St. Louis

9:825-996 (June) 1941

Statistical Method: Vital Tool in Clinical Medicine. H. E. Campbell, Boston.—p. 825.
Bullet in Heart for Twenty-Three Years. G. G. Turner, London, England.—p. 832.
Excretion of Sulfanilamide and Sulfapyridine in Human Bile. W. W. Spink, G. S. Bergh and J. Jermsta, Minneapolis.—p. 853.
Value of Local Implantation of Crystalline Sulfanilamide About Gastrointestinal Anastomoses in Dogs: Valuable Adjunct in Prevention of Peritonitis. R. L. Varco, L. J. Hay and Beatrice Stevens, Minneapolis.—p. 863.
*Peritoneal Vaccination, Irrigation and Chemotherapy in Treatment of Experimental Peritonitis. E. R. Schmidt, A. R. Curreri, F. G. Hidde and E. P. Adashek, Madison, Wis.—p. 871.
*Local Use of Sulfanilamide. L. W. Long and J. G. Dees, Jackson, Miss. —p. 878.
Surgery of Brain Tumors Today and Ten Years Ago. E. Sachs, St. Louis.—p. 883.
Mechanical Superiority of Annealed Stainless Steel Wire Sutures and Ligatures. D. J. Preston, Wilmington, Del.—p. 896.
*Role of Bronchoscopy in Treatment of Pulmonary Abscess. H. J. Moersch and A. M. Olsen, Rochester, Minn.—p. 905.
Primary Sarcoma of Stomach. A. L. Cameron and P. J. Breslich, Minot, N. D.—p. 916.
Cisternal Encephalography: Utilization of Spontaneous Filling of Ventricles with Air Following Withdrawal of Fluid by Cisternal Puncture. R. H. Young, Omaha.—p. 931.
Autolocking Silver Clip. M. DeBakey, New Orleans.—p. 938.

Treatment of Experimental Peritonitis.—Schmidt and his colleagues studied direct smears and aerobic and anaerobic cultures of peritoneal exudates of 15 dogs at death. In 4 dogs with cecal perforation, direct smears showed gram-negative bacilli, streptococci, gram-positive spore formers and a few diphtheroids. Aerobic cultures showed Escherichia coli and Streptococcus viridans (enterococcus). Anaerobic cultures showed the foregoing organisms and Clostridium perfringens. In the 11 dogs with ileac perforation, gram stains showed small gram-negative bacilli, gram-positive spore formers, streptococci and occasional gram-positive diplococci. Aerobic cultures revealed E. Coli and Str. viridans. In 3, cultures also showed Staphylococcus albus, Proteus vulgaris, Aerobacter aerogenes and a gram-negative motile bacillus of the Salmonella group. The authors determined on dogs the effectiveness of peritoneal vaccination toward subsequent peritonitis and the therapeutic efficacy of peritoneal irrigations and chemotherapy in peritonitis. The commonly used antigen was coli bactragen, a suspension of formaldehyde-treated colon bacilli in gum tragacanth and aleuronat, and the drug was usually azosulfamide. For the peritoneal irrigations saline sodium ricinoleate (soricin) and zephiran (alkyl-dimethyl-benzene ammonium chloride) were used. The authors' conclusions are: 1. Peritoneal vaccination (with coli bactragen) in dogs prior to the operative production of ileac perforation protects against subsequent peritonitis. It should be given from twenty-four to seventy-two hours before operation. The vaccine produces a sterile peritoneal exudate rich in phagocytes which combats the infection in its early stages and controls it before an overwhelming bacterial growth occurs. Local defensive tissue changes, edema and congestion are a stage ahead of the bacterial offense following vaccination. 2. Peritoneal irrigations have no value either mechanically or chemically in the treatment or prevention of peritonitis. The washings do not reach all surfaces or the bacteria and their toxins. Bacteria or bacterial toxins that have invaded tissues or lymphatic and hematogenous channels are not reached by irrigations. Continuous peritoneal lavage can cause shock and often results in death, even in an unaffected peritoneal cavity. 3. Sulfanilamide, azosulfamide, promin (glucoside derivative of 4:4'diaminodiphenylsulfone) and related drugs permit the physiologic immunity reactions to combat the invading bacteria. The low level of blood sulfanilamide in the dogs suggests that excretion is rapid and the more frequent injections would probably be more effective.

Local Use of Sulfanilamide.—Long and Dees discuss the local use of sulfanilamide crystals in the office and the hospital. Cases which can be treated in the office are local infections, small lacerations, boils, abscesses and the less severe injuries in which powder can be placed in the wound and the wound sutured without drainage. If the infection and injury seem serious enough, sulfanilamide is also given by mouth. When the use of ointment is indicated in office treatments the authors use equal parts of thoroughly mixed sulfanilamide crystals and hydrous wool fat. The types of cases requiring hospital care are: Crushing and lacerated injuries; in these, after the wound is debrided and scrubbed, it is dusted with sulfanilamide powder and closed without drainage. Compound fractures; after the injured part has been prepared, 20 Gm. of sulfanilamide for adults and proportionally smaller amounts for children is placed into the fracture site both beneath and on top of the periosteum and the subcutaneous area, the wound is closed without drainage and the part is immobilized in a plaster of paris splint. Carbuncles; in these the authors resorted to intravenous anesthesia, thorough incision with the radioknife, removal of infected tissue by electrocoagulation and packing with sulfanilamide powder. Incision and drainage and daily dusting of sulfanilamide powder into cavities of local abscesses have shortened the duration of the infection and apparently aided materially in the cure. Appendical and pelvic abscesses were treated most successfully without drainage by incising and irrigating the abscessed cavity, the placing of from 20 to 30 Gm. of sulfanilamide powder into them and closing the abdomen. Peritonitis following acute appendicitis has been treated successfully without any deaths by dusting the sulfanilamide powder into the peritoneal cavity. The absorbability of the drug is proportional to the peritoneal reaction present. The prophylactic use of sulfanilamide, by dusting into the pelvis, in chronic salpingitis, hydrosalpinx, supravaginal hysterectomy and tubo-ovarian abscess has been satisfactory. Its use is advantageous as a prophylactic measure following any gastrointestinal surgery with peritoneal soiling.

Bronchoscopy in Pulmonary Abscess.—Moersch and Olsen treated 193 patients with putrid pulmonary abscesses by bronchoscopic drainage. Abscesses that occurred secondary to tuberculosis, bronchiectasis, benign or malignant tumor of the bronchus or aspirated foreign body were not included. Of 105 patients treated between Jan. 1, 1925 and Dec. 31, 1930 satisfactory results were obtained in 65.5 per cent. The mortality rate was 5.7 per cent. Of 88 patients treated between Jan. 1, 1931 and Dec. 31, 1938 the results were satisfactory in 61.5 per cent and the mortality rate was 3.3 per cent. In 5 of the 9 patients who died empyema was associated with the abscess, and probably bronchoscopy should not have been attempted. Pneumothorax and pulmonary edema was the cause of death of the other 4 patients. Only 1 patient classified as having been treated successfully by bronchoscopic drainage suffered a recurrence during the following ten years, and in this instance the second abscess was found in the opposite lung. The duration of the pulmonary abscess before treatment was instituted determined prognosis; among 19 patients who had their abscesses less than four weeks 17, or 89 per cent, responded satisfactorily. For those patients whose abscesses were present for four weeks but less than three months the satisfactory results dropped to 69 per cent. The authors' procedure has been to keep the patient absolutely at rest and on postural drainage for two weeks and if at the end of this time the abscess has not begun to resolve spontaneously they proceed with bronchoscopic aspiration. If the region cannot be drained adequately or if some satisfactory improvement does not take place after two or three bronchoscopic aspirations, surgery is resorted to.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

16:81-144 (June) 1941

Changes in Blood Produced by Dehydration in Infancy. A. G. V. Aldridge.—p. 81.
Diagnosis and Conservative Treatment of Bronchiectasis in Children. Beryl E. Barsby and R. E. Bonham-Carter.—p. 95.
Infantilism, Obesity and Retinal Dystrophy: "Forme Fruste" of Laurence-Moon-Biedl Syndrome. R. W. B. Ellis and F. W. Law.—p. 105.
Desoxycorticosterone Acetate and Estradiol Dipropionate Therapy in Newborn Infant. R. A. Miller.—p. 113.
Survey of Primary Infantile and Juvenile Pneumonia. M. Elliott.—p. 121.
Malignant Hypertension in Childhood. D. Court.—p. 132.

Glasgow Medical Journal

17:173-194 (June) 1941

Interior of Living Eye Considered as Biochemical Laboratory. A. M. Ramsay.—p. 173.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

48:293-420 (June) 1941

Fibroid Tumors of Uterus. N. P. Mahfouz and I. Magdi.—p. 293.
Analgesia and Anesthesia in Obstetrics. H. R. Griffith and J. R. Goodall.—p. 323.
Urologic Complications of Carcinoma of Cervix Uteri. T. F. Todd.—p. 334.
Fetal Abnormalities that Cause Difficult Labor. B. H. Sheares.—p. 354.
Hepatic Hemorrhage in Stillborn and Newborn Infants: Clinical and Pathologic Study of Forty-Seven Cases. J. L. Henderson.—p. 377.
Sarcoma of Femur Complicating Pregnancy: Case. J. St. G. Wilson.—p. 389.

Practitioner, London

146:353-416 (June) 1941

Some Modern Problems of Tropical Hygiene. M. Watson.—p. 353.
Treatment of Malaria. L. Rogers.—p. 361.
Modern Views of Dysenteries and Their Treatment. E. H. V. Hodge.—p. 365.
Diseases of Women in Tropics. Mary G. Blacklock.—p. 372.
Morphine for the Wounded. P. Hamill.—p. 380.
Inoculation Against Typhoid Group of Fevers. H. C. M. Williams.—p. 384.
Some Common Causes of Painful Feet. P. Wiles.—p. 389.
Science and Art of Medicine. A. J. Hall.—p. 395.
Thirst. A. Abrahams.—p. 400.
Unusual Development in Case of Hernia Treated by Injection. A. Kefalas.—p. 404.
Modern Therapeutics: XXIV. Tonics. F. J. Charteris.—p. 405.

146:417-480 (July) 1941

General Practitioner and Care of Newborn Baby. C. McNeil.—p. 417.
Asphyxia Neonatorum. N. B. Capon.—p. 423.
Infections of Newborn. S. Graham.—p. 430.
Feeding of Newborn Baby. K. H. Tallerman.—p. 435.
Treatment of Premature (Immature) Baby. W. R. F. Collis.—p. 442.
Changing Aspect of Abdominal Surgery of Modern Warfare. G. Gordon-Taylor.—p. 448.
Heat Stroke and Allied Conditions. C. Wilcocks.—p. 463.
Minor Surgery of Ear. C. P. Wilson.—p. 469.

Quarterly Journal of Medicine, Oxford

10:65-138 (April) 1941

*Vicious Circle in Chronic Bright's Disease: Experimental Evidence from Hypertensive Rat. C. Wilson and F. B. Bryom.—p. 65.
Methemalbumin: I. Clinical Aspects. N. H. Fairley.—p. 95.
Id.: II. Its Synthesis, Chemical Behavior and Experimental Production in Man and Monkeys. N. H. Fairley.—p. 115.

Vicious Circle in Chronic Bright's Disease.—Wilson and Byrom present experimental evidence that a vicious circle exists in hypertensive renal disease. They produced hypertension by the silver clip method of Pickering and Prinzmetal in rats from 6 to 9 months old. The authors' conception of a vicious circle arose from the demonstration by Goldblatt, Lynch, Hanzal and Summerville that reduction of blood flow through the kidney in animals gives rise to hypertension and from their own discovery that the hypertension produced by partial constriction of one renal artery gives rise to severe acute vascular lesions in the opposite kidney and in other organs. The character and extent of these lesions are such that the blood flow through the kidney might be reduced. If the clamped kidney is removed, residual hypertension follows in two thirds of the cases. The degree of residual hypertension is related to the extent of the lesions in the remaining kidney. The vicious circle results from the effect of hypertension on the kidney; the hypertension produces vascular lesions, and these, by reducing the blood flow through the kidney, aggravate the hypertension. This vicious circle leads to sustained hypertension and progressive renal destruction. In discussing the clinical implications of this concept the authors point out that their work throws no light on the primary cause of either essential hypertension or nephritis, but it provides the reason for the unsatisfactory nature of many of the classifications; that the different types of Bright's disease which in their early stages are clearly distinct lose their separate identities as the disease progresses, pursue a common clinical course, characterized by hypertension and renal failure, and acquire a common microscopic renal picture. Once the view is accepted that the chronic stages of these diseases are determined by irreversible hypertension and that this hypertension may arise outside the kidney or as a result of primary renal damage, then only can an acceptable classification be derived from the study of the life history of the disease and of the primary etiologic factors. As the latter are still not known, the clinical features in the early stages should receive special attention and they should be correlated with the microscopic observations of patients who die before secondary hypertensive changes complicate the picture.

Tubercle, London

22:135-158 (June) 1941

Radiographic Appearances of "Preclinical" Tuberculosis. G. Hilton.—p. 135.
*Case for Discussion, with Special Allusion to Congenital Absence of Lung. D. G. Madigan.—p. 144.

Congenital Absence of Lung.—Madigan reports that a woman of 23 who was referred to the Penge Clinic as probably having pulmonary tuberculosis appeared healthy, but examination of the chest revealed shrinkage of the left hemithorax with concomitant features of unilateral pulmonary fibrosis. However, the physical signs were anomalous and did not conform to this condition. Roentgenograms suggested either unilateral fibrosis or massive collapse of the left lung. The size of the affected side was considerably reduced and almost completely opaque to the roentgen rays. The mediastinal structures were displaced toward the left, and there was increased obliquity of the ribs. A hypertrophied emphysematous configuration was to be seen in the right hemithorax. In addition, heavier and more numerous pulmonary markings furnished evidence of hypertrophied blood vessels. An accurate interpretation of the abnormalities exhibited was problematic. The observations at a bronchoscopic examination were (1) displacement of the trachea to the left with no inflammatory changes of the mucous membrane, (2) a normal carina, (3) a patent left main bronchus, a nonoccluded lumen and no evidence of external pressure and, (4) on visualization of the main divisions of the left bronchus, a trace of pus in the left lower lobe; the mouths of the visualized bronchi were abnormally small and the first dorsal branch arose abnormally from the left main stem. A diagnostic artificial pneumothorax was impossible, as an air space could not be established. At tomography an elongated air space was visible posteriorly opposite the third, fourth, fifth and sixth ribs. The left main bronchus could be seen dividing in the 7 cm. section. No pulmonary markings were present on the left side. The right lung extended across the midline anteriorly, suggesting compensatory hypertrophy. No etiologic evidence was elicited from the patient or her mother. There was no evidence of an inhaled foreign body; moreover, such bodies usually enter the right rather than the left bronchus. There can be little doubt that the lesion was a congenital defect. The late manifestation of symptoms might have been due to the fact that the patient did not have measles and pertussis, which bring to light any existing pulmonary damage, her change of domicile two years before from the north to the south and her change of occupation eighteen months before from domestic duties at home to factory life in London.

Schweizerische medizinische Wochenschrift, Basel

71:601-632 (May 10) 1941. **Partial Index**

Atelectasis in Spontaneous Pneumothorax. J. Palacio and E. S. Mazzei. —p. 601.
Facultatively Open Pulmonary Tuberculosis (Demonstration of Tubercle Bacilli in Absence of Sputum). J. L. Burckhardt.—p. 604.
Value of Gastric Evacuation of a Fasting Stomach in Search for Tubercle Bacilli. M. Gilbert.—p. 609.
External Treatment of Lupus by Curettage and Electrocautery. J. Golay.—p. 611.
*Types of Hematogenous Pulmonary Tuberculosis. St. J. Leitner.—p. 612.
Contact Therapy with Roentgen Rays in Lupus Carcinoma. O. R. Mengis.—p. 624.

Hematogenous Pulmonary Tuberculosis.—Leitner examined the lungs of 467 patients with extrapulmonary tuberculosis. He found that 174 patients were free from pulmonary foci, except for residues of the primary complex. The remaining 293 patients exhibited apical metastases, early and late dissemination, interval forms with and without cavities, cavernous tuberculosis, solitary or multiple infiltrates, exudative pleurisy and miliary tuberculosis. Eighty-seven patients stated that the pulmonary process was first to develop. Apparently extrapulmonary and pulmonary tuberculosis are not mutually exclusive. The longer the extrapulmonary forms can be observed, the oftener will the pulmonary processes be detected. The most important diagnostic aid in detecting the various forms of hematogenous pulmonary tuberculosis is the roentgenogram. The hematogenous forms of pulmonary tuberculosis are characterized by insidious onset and development, but the physical signs are practically the same as in isolated pulmonary phthisis. Hematogenous tuberculosis has a somewhat unique position as regards the antigen-antibody reaction. The Meinecke reaction for tuberculosis may be negative or weakly positive. The slight excess of antibodies seems to indicate a weak humoral defense, and this may be a contributing factor to the hematogenous distribution. The tuberculin allergy is generally quite pronounced. Thus the cutaneous sensitivity to tuberculin and the seroreaction may show contradictory behavior. The open, cavernous cases of hematogenic pulmonary tuberculosis respond relatively well to collapse therapy.

Deutsche medizinische Wochenschrift, Leipzig

67:281-308 (March 14) 1941. **Partial Index**

*Importance of Microscopy with Electronic Rays for Structural Research and Microbiology. H. Ruska.—p. 281.
*Effects of Neoplastic Interpretation of Leukemias. K. Apitz.—p. 286.
*Simplified Dietetic Treatment of Peptic Ulcer. J. Drevs and H. Voss. —p. 289.
Military Service Injury in Patients with Pulmonary Tuberculosis. O. Steinmeyer.—p. 292.
Prognosis of Angina Pectoris. S. Dietrich.—p. 294.

Electronic Microscopy in Structural Research and Microbiology.—According to Ruska the electronic or "Super" microscope makes it possible to visualize an object about a million times as small as one visible with the ordinary microscope. The examination is made in a vacuum. The electrons transilluminate layers too thin for ordinary microscopy. The slides consist of organic films of collodion 0.00001 mm. in thickness. It may become possible to establish a bridge between morphology and chemistry with the aid of ultramicroscopy. Beginning with the synthesis of organic substances, the chlorophyll grain of the plant cell, it was possible to explain the structure of the chloroplast and to make it appear probable that not only the synthesis of sugar but also the synthesis of virus proteins takes place in the chloroplasts. A chloroplast from the tobacco plant is shown in which grains and stroma and round disks can be seen. In virus diseased plants several rod shaped virus protein molecules can be seen beside the grains. These rods seem to be in direct connection with the chloroplastic stroma. Thus the chloroplast becomes the seat of the pathologic process within the cell. Molecules of animal starch, or glycogen, have been visualized. The author shows the structure of fibrin, of a partial transverse section through cell wool, the micelle structure of the secondary wall of cotton hair decomposed by hydrochloric acid, "crystallized" tobacco mosaic virus protein, the colloidal gold test, the thorn-apple shape of an erythrocyte, a partially hemolyzed erythrocyte, the torn membrane of a completely hemolyzed erythrocyte, staphylococci on which membranes can be seen, colon bacilli with detached membranes, the bacillus of chicken tuberculosis, vaccine and other viruses.

Neoplastic Interpretation of Leukemias.—Apitz points out that the leukemias are now regarded as a special form of a neoplasm. This interpretation poses the problem of differentiating borderline cases and cases of combined leukemia and circumscribed neoplasm. Concurrence of tumor and leukemia in the same patient is possible. The microscopic examination of removed lymph nodes does not permit differentiation between lymphosarcoma and lymphadenosis; it must be complemented by blood studies and by studies of the blood forming organs and of the sternal marrow. The demonstration of a local sarcomatous blood cell proliferation does not exclude the simultaneous existence of a systemic disease. During the therapeutic irradiation of a lymphosarcoma not only the local response should be watched but also the behavior of the entire organism, particularly the blood picture, because a metastatic leukemia may develop. Circumscribed plasmocytomas or myelomas should be subjected to surgical treatment only when the dissemination of plasmocytoma cells can be excluded by sternal puncture and roentgenoscopy.

Diet in Gastric Ulcer.—Drevs and Voss report results obtained with Meulengracht's diet, which consists of mixed puréed meat and vegetables, in 57 patients with bleeding gastric ulcers and in 146 patients with nonbleeding ulcers. Two of the patients with bleeding ulcers died (3.5 per cent). The diet was successful in 135 of the 146 patients with nonbleeding ulcers; it failed in 8 because of complications, while 3 died of intercurrent disease. The average duration of treatment was thirty days for patients with bleeding ulcer and twenty-seven for those with nonbleeding ulcers. The results indicate that the Meulengracht diet gives results which are at least as good as those of the customary diets.

Kekkaku, Tokyo

19:151-236 (March) 1941. **Partial Index**

*On the Pathogenesis of Lymphadenitis Colli Tuberculosa. H. Matuno. —p. 209.

Tuberculous Cervical Adenitis.—Matuno made a detailed study of the tonsils and other lymphoid tissues of the neck in 60 patients, altogether a total of 1,443 lymph nodes and 138 tonsils. The hematogenous nature of tubercle formation in these tissues was evidenced by the fact that the earliest stage of the tubercles was seen at the terminal branches of the arterial ramifications as well defined nodules either in the cortex or in the medulla limited by the sinuses. Favoring the theory of lymphogenous origin of tubercle formation was evidence of various degrees of exudative inflammation at the marginal, interstitial and medullary sinuses of the lymph nodes, in response to the tubercle bacilli or their catabolic products which entered the nodes by way of the afferent channels. In the tonsil the hematogenous infection was usually found localized either within the lymphoid follicles or in their neighborhood in the form of miliary tubercles which tended to undergo healing fibrosis. Little evidence was found of lymphogenous infection in the tonsil; such changes as had occurred from lacunar epithelium tended to undergo necrosis, making probable the spread of the disease to the interfollicular tissues. In individuals without evidence of localized and well defined tuberculous infection in the respiratory or gastrointestinal tract, the microscopic study of cervical lymph nodes often demonstrates the presence, as well as the nature and extent, of the disease. Information derived from these studies also suggests the probably tuberculous nature of the disease in the organs and tissues served by the lymphatic tissues under consideration. Tuberculous cervical adenitis as an independent disease entity can, though rarely, occur during the generalized stage of Aschoff and Ranke, not only by way of the blood stream but more often by the lymphatics from the hematogenous focus in the lymphoid tissue. Retrograde lymphogenous infection of the cervical lymph nodes from the tuberculous nodes in the supraclavicular areas rarely occurs.

Taiwan Igakkai Zassi, Taihoku, Formosa

40:427-646 (March) 1941. **Partial Index**

*Local Reactions of Infected Skin, Clinical Symptoms and Blood Changes in Experimental Human Infection with Strongyloides Papillosus and S. Fülleborni. S. Tomita.—p. 427.

Experimental Human Infection with Strongyloides.—Tomita conducted experimental transmission of two varieties of Strongyloides in 6 human subjects and reports his observations on the resulting cutaneous reactions, clinical manifestations and blood changes at varying intervals. Strongyloides papillosus is a parasite found in hogs and Strongyloides fülleborni in Formosan monkeys, both having a somewhat varying degree of pathogenicity in other species of animals. Cultures of these parasites were obtained from the feces of hogs and monkeys, and the young parasites, growing after three to six days of incubation, were used in transmission experiments. The skin over the outer aspect of the thigh was first thoroughly cleansed with soap and water and the area then covered with a thin pad of absorbent cotton about 4 cm. in diameter, over which had been sprayed approximately 5,000 parasites suspended in a small amount of water. After the cotton had been wet with additional water, the transmission pad was tightly bandaged and allowed to remain in contact with the skin for twenty-four hours. At the end of that period the cotton was removed, washed in water and examined for the presence or absence of the parasites. From these experiments the author found that both S. papillosus and S. fülleborni could be transmitted to man through the intact skin, which at the site of contact caused the skin to become red and hot, accompanied by a tingling sensation and occasionally by development of vesicular lesions. The skin reaction following application of S. papillosus was much more severe than that of S. fülleborni. In spite of the severity of local reaction due to S. papillosus, no systemic reaction occurred. But, while S. fülleborni produced only slight local reaction, it gave rise to such acute systemic reactions as urticaria, nervous manifestations, gastrointestinal disturbances and sometimes fever. The transmitted parasites migrated to the intestine, and ova were recovered from the fecal material. This difference in the pathogenicity of the two strains of parasites studied was also reflected in the degree of blood eosinophilia, which was the only hematologic change noted. The ova of S. fülleborni could be detected in the stools of the infected patients for as long as eleven months after transmission.

Sovetskaya Meditsina, Moscow

Pp. 1-46 (No. 7) 1941. **Partial Index**

Epidemiology of Typhoid and Its Combat in Rural Areas. L. V. Gromashevskiy.—p. 3.
*Typhoid in Vaccinated. E. E. Shtaynshneyder.—p. 8.
Surgical Treatment of Typhoid Peritonitis. M. A. Mir-Kasimov.—p. 11.
Bacteriophage Therapy of Typhoid. M. B. Aleksandrov, A. A. Dyakova, Z. A. Raykhelson and E. G. Melnik.—p. 13.

Typhoid in Vaccinated.—On the basis of observation of a large number of typhoid cases occurring in persons who were not vaccinated and in those who were, Shtaynshneyder concludes that typhoid in vaccinated persons presents a special form of the disease different from the usual clinical forms of typhoid. The prophylactic action of the vaccination lasts for five or six months, after which the immunity is considerably lowered. The epidemiologic significance of typhoid in the vaccinated derives from the fact that it is more tardily recognized because of its atypical clinical picture. The onset is usually abrupt. The fever is relatively low, between 100.4 and 102.2 F. The febrile stage lasts from eleven to twenty days as compared with twenty-five to thirty days in the unvaccinated persons. Symptoms of central nervous system involvement are exceptional. The period of convalescence amounts to from eight to fourteen days as compared to the average of twenty-five to thirty days in unvaccinated persons. The Widal reaction is particularly important as a diagnostic sign and occurs on an average on about the fifteenth day of the disease. Positive blood cultures are obtained in only a small percentage of the cases. The incidence of bacillus carriers in the author's material amounted to 0.6 per cent, while in the unvaccinated it varies from 2.5 to 7.5 per cent. The mortality amounted to 2.3 per cent as compared with the mortality of from 5 to 8 per cent and higher in the unvaccinated.

Nordisk Medicin, Stockholm

10:1191-1270 (April 19) 1941. **Partial Index**

Hospitalstidende

*Treatment of Some Neuromuscular Diseases with Synthetic Vitamin E. (Amyotrophic Lateral Sclerosis and Progressive Muscular Dystrophia). J. Bang, L. Einarson, Aarhus M. Fog and A. Ringsted.—p. 1201.
Tuberculosis in Aged. H. Harpøth.—p. 1212.

Synthetic Vitamin E for Neuromuscular Diseases.—Bang and his associates report 8 cases of neurogenic muscular atrophy and 3 of progressive muscular dystrophia treated for from one to twelve months with vitamin E. There is evidence that vitamin E may have an effect at least on neurogenic muscular atrophy. They suggest as a working hypothesis that vitamin E exerts a therapeutically favorable effect on the degenerative fissure formation and the vacuolar and tubular degeneration in the muscles.

Ugeskrift for Læger, Copenhagen

103:427-458 (April 3) 1941

*Spontaneous Subarachnoid Hemorrhage: Symptomatology, After-Examination, Prognosis. H. C. A. Lassen and T. Vanggaard.—p. 427.
So-Called Spontaneous Subarachnoid Hemorrhages, with Special Regard to Prognosis and Eventual Psychic Changes. A. Leth Pedersen.—p. 439.
Two Cases of Aneurysm in Middle Cerebral Artery: Casuistic Report. Erna Christensen.—p. 446.

Spontaneous Subarachnoid Hemorrhages.—Lassen and Vanggaard's discussion is based on 43 cases treated from 1932 to 1939. They state that spontaneous subarachnoid hemorrhage is rare in the first decade of life and after 60; half of their patients were under 40, and the average age was 40. In 42 cases there was headache, usually apoplectiform and violent, in the initial stage; pain in the neck occurred in 15, vomiting in 37, dizziness in 14, partial insensibility in 28 and complete loss of consciousness in 17. Complete loss of consciousness was frequently apoplectiform, usually of short duration. During hospitalization stiffness of the neck was established in 40, spasms in 5, unilateral or bilateral Babinski in 22, absence of abdominal reflexes in 12, slight focal symptoms in 16, massive focal symptoms in 3. The temperature was normal in 27 out of 32 in the initial stage. Thirteen of 32 patients showed pathologic changes, most often stasis in the blood vessels of the retina; 6 of the 13 had grave hypertension. In all cases the spinal fluid was sanguinolent or xanthochromatic with many polymorphonuclear leukocytes at the start of the disorder. Later mononuclear pleocytosis predominated. There was moderate rise of temperature after the initial stage, lasting from one to two weeks. The sensibility generally cleared up in a day or two, but in some cases unconsciousness continued until death. Removal of spinal fluid was often of symptomatic-therapeutic value, and no symptoms were seen which pointed to renewed hemorrhage caused by the reduction of the blood pressure through this procedure. The cause of the hemorrhage was established in only one instance—hemorrhagic pachymeningitis. In the 31 patients discharged the headache disappeared in from three to five weeks, stiffness of the neck in four or five weeks. After-examination of 27 of the 31 patients after from one-half to seven and a half years (half of them after from three to seven and a half years) showed that 20 were fully able to work, 6 partly able and 1 wholly unable. Headaches, nervousness or impaired memory persisted in 24. The likelihood of renewed hemorrhage is slight if there have been no signs of renewed bleeding during the first three months after the primary attack. Unfavorable prognosis is indicated by (1) complete loss of consciousness, (2) moderately grave or grave hypertension, (3) strongly increased pressure of the spinal fluid, (4) positive Babinski, (5) spasms after the initial stage, (6) gradually increasing pulse and rise of temperature. The prognosis seems more unfavorable if there is a history of previous manifest subarachnoid hemorrhage or acute cerebral attacks with a similar picture. No plausible etiologic factor was found in 16, there were pathologic changes of doubtful significance in 9, hypertension in 13 (marked in the 10); 1 patient had severe migraine, 1 a positive Wassermann reaction in the blood and spinal fluid without clinical signs of syphilis, 1 thrombopenia, 1 hemorrhagic pachymeningitis and 1 possibly an aneurysm in the basilar artery (clinical diagnosis).

THE STUDENT SECTION

of the

Journal of the American Medical Association

Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals

SATURDAY, SEPTEMBER 27, 1941

Concerning Interns and Their Health

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Two years ago the Trustees of the American Medical Association asked of the Council on Medical Education and Hospitals that a study be made of the health of interns. Such a study was begun at once. A report of the preliminary steps of the investigation was presented to the House of Delegates [1] a year ago. Briefly, there appeared no evidence to suggest that the health of interns was notably bad; yet among sixty-one interns who during the three year period of 1937, 1938 and 1939 were compelled to discontinue work because of illness, tuberculosis was an important and significant factor. This disease occurred in 36 instances and thus caused 59 per cent of all the serious casualties. This information was obtained by inquiry from 235 hospitals approved for intern training.

During the past year the problem of intern health has been further investigated from a different angle. Communications were sent to 5,301 physicians who received their medical diplomas from recognized schools in 1937. They were asked to give an account of their hospital experience, and also the nature of any illness suffered during it, with a line stating the amount of time lost from work. This method of studying intern health was adopted in the belief that physicians in general might be interested in a study of this nature and that, as a typical group, men and women four years out of medical school would remember their own illnesses with sufficient vividness to make the data obtained both interesting and accurate.

Two thousand, eight hundred and forty replies to the questionnaire have been received; in addition there are records in the files of the American Medical Association of 34 fatalities known to have occurred among the men who graduated in that year. This paper reports a digest of the information obtained in this manner.

One of the most striking facts elicited from this study is the present desirability of prolonged periods of hospital life in the minds of young doctors: 807 (28 per cent) were satisfied with but one year of hospital experience, 905 (32 per cent) had hospital experience up to two years and 1,131 (40 per cent) have had three or more years of hospital residence. Of the latter group, many still are occupying resident posts of one sort or another. The zeal on the part of young doctors and their teachers to lengthen rather than shorten the program of medical education through postgraduate work in hospitals is amply illustrated by these figures.

The influence of a long period of secluded, almost monastic existence in a hospital on a young doctor's health is now by necessity of considerable general interest. For such a life by no means creates immunity to sickness. Of the 807 doctors who had one year internships, 395, or 49 per cent, lost no time from work. Of the 905 who lived in hospitals for two years, 264, or 29 per cent, escaped without illness. Of the 1,131 who lived in hospitals for three years or more, only 179, or 16 per cent, failed to be sick.

Such authorities as Dr. Haven Emerson and Dr. Louis Dublin consider that figures such as these are entirely usual. If a group of persons spent their lives in a hospital, they say, all would fall ill eventually, and the longer one had the group under observation the fewer would be those remaining continuously well.

The types of illness to which these particular interns and residents fell heir make a glossary of diagnostic terms. Naturally, infections of the upper respiratory tract were the commonest single incapacitator; much more noteworthy, however, were the bizarre diseases and accidents that were reported. There were instances of tularemia, of dengue fever, of typhus and of typhoid. There were cases of whooping cough, mumps, chickenpox, measles and scarlet fever.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

This study was made possible through the courtesy of the Council on Medical Education and Hospitals. Mrs. J. R. Spencer assisted in classifying and tabulating the data which are reported. The figures from the Boston Edison Company were prepared by the Division of Industrial Hygiene, National Institute of Health.

1. Proceedings of the House of Delegates, New York Session, J. A. M. A., **114**:1925 (May 11) 1940.

One intern was given four months leave of absence in order to have a baby. Another got so badly sunburned while skiing as to necessitate two or three days of cooling off. There were several cases of prostrating reactions to typhoid immunization, to poison ivy or to poison oak. There were many automobile accidents obtained in riding the ambulance. There were 24 cases of infectious mononucleosis and 31 cases of catarrhal jaundice, and there even was 1 case of undulant fever thought to have been acquired from hospital milk. There were gastric ulcers, duodenal ulcers, renal calculi and gallstones. There were sprains and fractures, infections of the arms, toes and fingers, and appendix operations galore. In fact almost any diagnosis that one might ask for was listed.

The illnesses on the whole were not incapacitating for long periods of time and proved to be of little more than a minor nuisance. Table 1 has been constructed on data from all cases in which sufficiently accurate information was available.

TABLE 1.—*Periods of Illness of Interns and Residents*

Number of Days Missed Because of Illness	One-Year Interns (410)	Two-Year Interns and Residents (597)	Three-Year or More Interns and Residents (909)
Less than 7 days.....	233 (57%)	279 (47%)	294 (32%)
8-14 days.....	93 (23%)	116 (19%)	215 (24%)
15-21 days.....	35 (9%)	69 (12%)	130 (14%)
22-28 days.....	11 (3%)	25 (4%)	48 (5%)
More than 4 weeks.....	38 (9%)	109 (18%)	221 (24%)

As can be seen, minor illnesses of short duration predominated, though apparently — and probably on the law of averages—the longer a man lived in an institution the better chance he had of losing increasing amounts of time from sickness and, presumably, of contracting some disease which could properly be termed serious. It was relatively uncommon for an intern or resident to be ill more than once or twice in the course of a year. There were occasional exceptions, however, certain ones apparently having little resistanee or much bad luck and as a result losing several weeks' time in the course of their hospital experience because of repeated minor misfortunes.

There were three diseases which were encountered so frequently as to make them seem of significant importance. These were appendicitis, pneumonia and tuberculosis.

There were 142 cases of appendicitis.[2] The appendicitis problem as presented by these figures offers an interesting field for speculation. Among 585 interns and residents living in the Peter Bent Brigham hospital during the past twenty-five years, only 8 cases of appendicitis were uncovered. During most of these years I have lunched in the hospital nearly every day and can vouch for the fact that no serious epidemics of indigestion ever developed. Among the 2,840 interns and residents from all over the country who answered my appeal for information, the occurrence of 142 appendectomies seems disproportionately high. In addition, there were 62 cases of gastroenteritis, 21 of diarrhea, 15 of alleged food poisoning severe enough to make work temporarily impossible and 34 complaints regarding the hospital bill of fare. I cannot help wondering whether poor food was not a factor in causing the stomach-aches that led to so many operations, and therefore whether the manner in which interns are fed does not warrant more careful attention than it often receives. Certainly, in any modern business it is a token of inefficiency to have many workers laid off from a cause so readily preventable.

To be sure, another explanation of the frequency of appendicitis among these interns and residents may be that the modern young doctor has faith in the prophylactic usefulness of getting rid of his appendix. When living in a hospital and acquiring a stomach-ache, why not have an appendectomy on general principles, without expense and performed by one's friends? The time lost from the operation is nowadays ordinarily only ten days or a fortnight, the risk of operation is negligible—though three of the fatal cases in the series were caused by this condition—and the knowledge that one is appendix-less may well give a physician a desirable sense of digestive security for the rest of his life.

There were 103 cases of lobar pneumonia and bronchopneumonia.[3] The incidence of pneumonia also opens up an interesting line of reasoning. In searching for a control group in which to compare the normal incidence of pneumonia in relation to all sorts of infections of the upper respiratory tract, the suggestion was offered that figures from the Surgeon General's annual reports[4] might be useful. These figures yield information on two groups of persons important to such a study: officers and white soldiers serving in the United States and Alaska; for both groups are given figures on illness which include all cases of men sick enough to be hospitalized. In establishing the figures which are recorded in the following table, "respiratory infections" include those diseases of the upper respiratory tract likely to be caused or complicated by the pneumococcus or streptococcus, infections such as the common cold, tonsillitis, otitis media and bronchitis.

2. There were 69 absences because of appendicitis among male workers of the Boston Edison Company during 1938, 1939 and 1940.

3. There were 26 absences because of pneumonia among male workers of the Boston Edison Company during 1938, 1939 and 1940.

4. Report of the Surgeon General, U. S. Army, to the Secretary of War, 1938, 1939, 1940, Washington, D. C., U. S. Government Printing Office.

The figures given in table 2 probably do not warrant as sweeping conclusions as might be drawn from superficial examination. But they are suggestive. They suggest that officers, a little older than the enlisted men and probably living in more protected quarters, are less liable to contract pneumonia in connection with exposure to respiratory infections than are the enlisted men. On the other hand, doctors are much more likely to contract pneumonia in connection with infections of the upper respiratory tract than are soldiers. While these figures may caricature the true facts because of differences in diagnosis and methods of assembling the data or from other factors, yet they point out a trend which is easily credible. It is entirely reasonable to expect that interns and residents should contract pneumonia more easily than the average individual, exposed as they are in a busy hospital to persons with all kinds of infections, leading a confined life and often overworked. From the point of view of industrial hygiene, this fact also warrants further study for the purpose of developing rational methods to improve intern health.

There were 44 cases of pulmonary tuberculosis and 4 of pleurisy with effusion assumed to be tuberculosis.[5] This was the most expensive disease from the viewpoint of loss of time.

Considering that among all United States Army officers during the last three year period only 34 cases were discovered and that the incidence of the disease among the white enlisted men during that time averaged 1.51 cases per thousand a year—which would yield in three and a half years only about 22 cases in 5,000—the incidence of 48 cases of tuberculosis as reported among these interns and residents seems unduly high. Obviously, so small an experience is of no statistical value whatever, yet perhaps it is worth mentioning that of these 48 cases 5 occurred in women. This fact is stressed because only about five women per hundred are encountered in the student population of our medical schools, and among the 2,840 replies to the questionnaire for this study only 100 came from women. From this single sampling, meager as it is, I believe that hospitals which train women interns should be urged to take special precautions to prevent the development of tuberculosis in their female resident staff, as the stubbornness and costliness of tuberculosis in young women is notorious.

A letter was sent to all those in this series who had been afflicted with tuberculosis, asking for information as to how in their case the disease was discovered and for ideas as to how it might have been prevented. Thirty-five answers were received, and the ensuing correspondence has proved most enlightening.

There clearly is developing a sound tendency in our medical schools to submit each student at entry to a tuberculin test and a roentgen examination of the chest. In many schools the positive reactors are reexamined roentgenographically each year thereafter, the negative reactors are retested each year and all seniors, regardless of their tuberculin reactions, are given a final roentgen examination shortly before graduation. Thus many students are now able to state on graduation that, as judged by these tests, they have no demonstrable evidence of any active focus of pulmonary tuberculosis.

The student becomes a doctor when he receives his diploma at his graduation exercises and soon begins his internship. Here he may be overworked, perhaps not well fed, and he may be exposed to tuberculosis in a variety of ways. If he contracts tuberculosis it is likely to develop insidiously, so that several months often elapse before the case is recognized. Occasionally he may have a sudden hemoptysis and thus be treated more promptly.

TABLE 2.—*Incidence of Pneumonia and Respiratory Infections*

	Pneumonia (Lobar and Broncho)	Respiratory Infections	Ratio of Pneumonia to Respiratory Infections
Army Officers			
1937	24	1,987	
1938	35	2,273	
1939	42	2,401	1:66
Total	101	6,661	
Enlisted White Men in United States and Alaska			
1937	378	12,878	
1938	454	17,006	
1939	435	17,350	1:37
Total	1,267	47,234	
Interns and Residents			
1937	...	.....	
1938	103	1,717	
1939	...	.....	1:17

A Pirquet test on one man in 1935 as a student was negative. Roentgenograms made once a year thereafter were negative—the last negative film being made in January 1939. In March or April, as an intern, he began to feel thoroughly tired out and presently to notice dyspnea on exertion and night sweats. A roentgenogram in July revealed minimal pulmonary tuberculosis.

In March 1938 and January 1939 roentgenograms of the chest were negative in a second case. Then as an intern he began to lose a little weight, to feel tired out and to lose his appetite—phenomena which he regarded as natural sequels to the hard work he was doing. A roentgenogram in May 1939 showed a small cavity in the upper portion of the right middle lobe.

During three years in medical school tuberculin tests and roentgenograms were negative in a third case. In January 1937 the tuberculin test became strongly positive, though in April the roentgenogram

5. There were 6 absences because of tuberculosis among male workers of the Boston Edison Company during 1938, 1939 and 1940.

was negative. In October 1937, shortly after his internship had commenced, the man felt a sharp pain in the right lower part of the chest. A roentgenogram now showed density in the right hilus with a suggestive area of infiltration in the third interspace. He continued work in spite of this finding and in January 1938 a roentgenogram revealed consolidation of the lower lobe of the right lung. Now the sputum was positive.

Roentgenograms and tuberculin tests were negative during the first three years of medical school life in a fourth case. During the senior year the tuberculin test became positive though roentgen films of the chest continued to be negative. In January 1940 a roentgenogram taken because of "pleurisy" showed a soft, well circumscribed lesion in the upper lobe of the left lung.

Almost all the doctors with whom I have corresponded have agreed on one point: They feel that on top of exposure hard work, poor food and chronic fatigue were the most important factors in leading to their breakdowns.

TABLE 3.—*Causes of Deaths of Interns and Residents*

Infections	16
Pneumonia	3
Appendicitis	3
Subacute bacterial endocarditis	3
Tuberculosis	2
Brain abscess	2
Meningitis and pneumonia	2
Cholelithiasis and peritonitis	1
Accidental trauma	6
Automobile accidents	5
Drowning	1
Malignant disease	4
Carcinoma of rectum	1
Teratoma of testis	1
Acute lymphatic leukemia	1
Hodgkin's disease	1
Coronary occlusion (ages 25, 28 and 35)	3
Self induced	3
Cerebral hemorrhage (age 26)	1
Nephritis	1

The food question, which is remediable, is one thing. How to avoid hard work and chronic fatigue during one's hospital career is another. In my experience the best interns invariably are the most energetic and conscientious students, and the better the intern the harder he works and the more responsibilities he assumes.

I spoke to one of my Brigham Hospital colleagues about the matter recently. He reminded me that when he and I were in residence together in the hospital some twenty-five years ago we thought that we were perpetually tired and chronically overworked. Since then the resident staff has assumed almost acromegalic proportions to keep up with new kinds of treatments and procedures that have been devised, and one might imagine that the present staff is well able, from point of numbers, to care for this extra load without risk of being overworked. Yet not long ago one of the medical interns kept a week's diary for my benefit. I have edited mildly a typical day:

At 8:30 to the wards to give treatments such as mercupurin and liver. In addition, there were lumbar punctures to be made and venous pressures or circulation times to be recorded; and in my spare moments requisition slips for roentgenograms and electrocardiograms to be filled out, or histories taken by students to be corrected.

Ward rounds began at 10 o'clock, lasting until a little after 12. As usual there were interruptions: new patients to be admitted, doctors to be seen who were inquiring about patients they had sent in and many telephone calls to be answered so that rounds could go forward without interruption.

At 12:15 was the clinical-pathologic conference, which lasted for an hour: A good show with a distinguished visitor led away from the correct diagnosis of gallstone disease by the false scent of a small bleeding polyp in the large bowel.

At 1:15 lunch for a quarter of an hour, and then a brief glimpse at THE JOURNAL and the morning paper. Then at 1:45 there were some special patients in the outpatient department to be attended to.

Back to the wards as soon as possible after 2 o'clock until supper time to take histories, examine patients, give treatments and keep the students busy on their cases.

Supper at 6 o'clock. At 6:30 back to the wards to start parenteral fluids, to complete the admission workups on the new patients, and to write records.

A bite of supper at 10 o'clock and then more histories to edit, more records to write and evening rounds to see that every one was comfortable before bedtime somewhere around midnight.

I dare say that this is a familiar day for countless interns; perhaps a light day for those in hospitals where there is more work to be done than possibly can be done by the available hands. Yet there is something fine about the internship, the overwork and the spirit that fosters medical ambition. It is likely to go on, making impossible in hospitals eight hour shifts and other labor union contrivances.

In spite of the illnesses to which interns and residents are liable and the hardships which they undergo yet the occupation of being on the resident staff of a hospital cannot be called a hazardous one. The department of statistics of the John Hancock Mutual Life Insurance Company informs me that, according to actuarial tables issued by life insurance examiners, $^{86}/_{89}$ of a group of men insured at the age of 25 should be alive four years later. Applying these figures to the 5,301 men who graduated from medical schools in 1937 and were written to and who probably averaged 25 years of age at that time, 5,122 should now be alive. Actually but 34 deaths have been reported.[6] Even allowing for a considerable number of fatalities of which the American Medical Association has not been informed, these figures give a comfortable leeway of security in favor of the argument that the occupation of being an intern is not hazardous to life. The causes of the deaths which were encountered, however, are pathetic and of some interest.

Certainly infections took their toll, as did accidents, though how many of these accidents or infections could have been prevented is difficult

6. Dr. W. D. Cutter supplied this information.

to imagine. The not infrequent development of malignant disease, coronary disease and cerebral vascular disease in young persons always is impressive—again not preventable in the light of present knowledge. That depressions severe enough to end fatally can occur in a group of young physicians at the very outset of their careers is a sad commentary on modern life—a baffling puzzle before the medical profession that so far has proved unsolvable. On the whole, the few deaths which have been reported seem due to mischance rather than to any cause more easily defined. That they were uncommon and much fewer than might have been expected on a statistical basis is pleasing.

Certain general conclusions seem justified from this study. A long-continued institutional experience not only is popular but also desirable for the better education of doctors. Interns and residents receive a valuable educational experience from their hospital life and contribute largely also to the efficiency and reputation of whatever hospital they work in. Hospital life does not protect against illness, and in fact the occurrence of diseases such as appendicitis, pneumonia or tuberculosis appears to be more frequent among interns and residents than among a population less intimately associated with exposure to disease.

In the light of present knowledge, the illnesses that interns and residents are likely to acquire are not often strictly preventable. Interns and residents, however, should be given proper living quarters, adequate recreational facilities, good food, happy surroundings and some form of systematized medical supervision in order to protect their health reasonably and thus enable them to accomplish more. Hard work, alone, when the man is well fed, in cheerful surroundings and under proper conditions of living, is unlikely to be deleterious. There should be enough interns in each hospital, however, so that no one intern is grossly overworked. The amount of effort that an individual chooses to undertake in hospital life cannot well be limited. On the other hand, a friendly interest on the part of older members of the staff in the amount of work that each intern does and in his physical and mental adjustments to it may do much to prevent catastrophes.

The problem of tuberculosis is important enough to receive particular consideration. At best, to have tuberculosis is a time-consuming, unpleasant experience for any young person to contend with. Increasing numbers of medical schools are beginning to approach this problem seriously by the periodic examination of their student body. Hospitals, in contrast, are backward.

Each medical student on graduation from his medical school should receive a card giving a complete report of his tuberculin test and roentgen examinations. Each hospital should make a rule to continue with this record by requiring chest films of its interns at six month intervals. Large hospitals dealing with vast numbers of patients should go even further. They should require their interns and residents to have chest films at three month intervals. If a rule of this sort were made general, tuberculosis in the resident staff would be recognized more quickly than it is at present, and unnecessary loss of time spent in treatment would be saved.

The health of doctors living in hospitals is an important matter. It deserves careful consideration.

ABSTRACT OF DISCUSSION

DR. HAVEN EMERSON, New York: Dr. Fitz speaks of 2,843 individuals; some of those, 807, had a one year experience, 905 had a two year experience and 1,131 had a three year experience. The total of that is six thousand and ten man years of exposure. What he is doing is to study the experience of young men of a certain age who have had six thousand and ten man years of exposure to a particular occupational condition. That is the basis on which the rates should be based, not on the basis of individuals, as if each individual in the series had exactly the same duration of exposure, which was not the case. Now, in the paper Dr. Fitz refers to the secluded, monastic life of these students, and then he tells us of sunburn from skiing, which isn't done on the hospital grounds, and poison ivy, which isn't found in hospitals, and then the occasional cases of tularemia which they get out shooting, not on the hospital grounds; and, besides that, four months off for pregnancy, which is not supposed to occur in a monastery. It seems to me these physicians are leading a very normal life; their morbidity experience is quite usual. Now it is important to realize what success Dr. Fitz had. If any of us should write to 5,300 persons and get 2,840 answers we would think we were very good correspondents. The persuasiveness of his postal cards and his friendly relation with these people is an important factor in the thoroughness of this study. He has had 55.6 per cent returns on the questionnaire, which is higher, I think, than would be expected and is an admirable sampling of the group he is studying. Of course, it is true that if 16 per cent were all that were not sick at three years one would expect 29 per cent not sick in two years and 49 per cent not sick in one year. When the medical officer of the army is faced with an epidemic, he overworks just like the intern, whereas the other army officers don't have any particularly added hazard; so I think it would be well in comparing resident interns or hospital residents with army officers to compare them with that fraction of army officers who are medical officers and thereby likely to be exposed to the same kind of epidemic and hospital exposure that hospital interns are exposed to. In times of epidemic prevalence of respiratory diseases, all hospitals are overcrowded, all doctors and nurses are overworked, loyalty tends to replace judgment, and interns and residents stay on the job longer than is good for them or for their patients. The annual death rate of this intern group is 5.66 per thousand. That is a rate that is not very far from the normal for this age and sex distribution. Their death rate is no different from the same age sex group in the community, but when one comes to appendicitis there is a difference. The appendicitis death rate per hun-

dred thousand of the general population has run from 14 down to about 11 or 10 in recent years. This intern group had a rate of 49.9, which is a tremendous death rate from appendicitis. There is an appendicitis incidence of 5.5 per cent of this total intern group. This demands explanation, and I hope Dr. Fitz won't drop it there but find out how many of these were unnecessary appendix operations and how many of them were really such as would occur in ordinary civil life in which the person had to count both the cost and the duration of interference with his work. I think it is of the greatest importance that we should have analyses of this kind, of persons with limited hazards for limited periods of time, so that we can show the extent of their medical risks.

DR. HAROLD S. DIEHL, Minneapolis: Most laymen and, I presume, physicians would accept it as axiomatic that health hazards in institutions dedicated to the restoration of health would be reduced to the minimum, and that the safeguarding of the health of the physicians and nurses living in these institutions would be one of their first concerns and responsibilities. Yet this survey shows that the life of interns is in some respects very unhygienic and that the incidence of certain serious infections among them is exceptionally high. The survey which Dr. Fitz has reported does not provide information concerning the acute minor illnesses among interns but it does show that appendicitis, pneumonia and tuberculosis occur with significant frequency. This agrees with our findings, that the leading causes of serious illness among 1,673 graduates from the University of Minnesota Medical School from 1909 to 1936 were pneumonia, tuberculosis, appendicitis and scarlet fever. It is tragic for 48 of the recent graduates of our medical schools to have contracted clinical tuberculosis during their internships, yet this is probably only the beginning of the story, because infections or reinfections with tuberculosis acquired during one's internship may result in the development of clinical disease which does not make an appearance for years afterward. In a study in which Dr. J. Arthur Myers and I collaborated we reported that 46 per cent of 65 young physicians who did not react to tuberculin on graduation from medical school became infected with tuberculosis, as evidenced by positive tuberculin reaction during their internships. This is a terrific rate of infection for a single year. Among student nurses in a general hospital Dr. Ruth E. Boynton found that the annual infection rate for tuberculosis was a hundred times as high as among college of education students from the same campus.

Epidemiologic studies show that most of these infections are probably acquired from patients in the hospitals or clinics in which the interns and nurses are serving. To prevent both of these types of unrecognized exposure in our University Hospital we have instituted thorough periodic physical examinations of all hospital personnel and have made a fluoroscopic examination of the chest a part of the routine physical examination of all patients admitted to the University Hospital or its outpatient clinic. The analysis of the results of these examinations revealed that in the first three months period 12 patients who were admitted to the hospital for other conditions were diagnosed as having, in addition, active pulmonary tuberculosis, previously undiagnosed, but in a moderately or far advanced stage. All these patients were potentially infectious. Many young physicians who have devoted years of their lives to preparation for the practice of medicine are sacrificing their health in hospital services as interns, and this at a time when our nation needs to conserve and possibly even expand professional medical services in connection with the defense program. Hospital authorities who are unwilling to try to improve this situation reply that individuals who wish to become physicians must accept the risks inherent in their profession. No one will disagree with this. But it does not follow that these young physicians should be exposed to unnecessary hazards to health and even to life itself. On the contrary, hospitals have an inescapable responsibility to provide for their interns, residents and nurses the very best living conditions and health protection that modern scientific medicine can offer.

DR. REGINALD FITZ, Boston: I should like to call Dr. Emerson's attention to the fact that the case of tularemia which occurred was not acquired in hunting but developed in line of regular hospital duty. Dr. Emerson has been most helpful in aiding me to prepare this contribution. I am flattered that two experts in public health would be willing to comment on this presentation. The health of interns can be studied later to better advantage and the problem is worth working at. This study, at least, is a beginning.

Digests and Reviews

A NEW INITIATE SPEAKS

Condensation of an address by Claude R. Hitchcock, delivered before the Theta Tau chapter of Phi Rho Sigma in accordance with the custom of having each initiate address the chapter at the first meeting following initiation.

In our generation all aspects of civilization are being subjected to the severest test they have ever had to endure. The philosophies for which the contestants in the present world conflict are fighting go deep into the core of man's existence.

There is no way, except by conjecture, to ascertain the lengths to which nations will be driven before the last chapters of the present catastrophe are closed. Here in the United States we have already started on a ruinous course of overexpansion of industry, excessive spending of monies and regimentation of man power that will have drastic repercussions when we are again favored with peace. While the nature of our trials to come depends on the outcome of the present war, of greater significance is the fact that we are going to be beset in either case by problems that will tax the last ounce of strength in our democratic system.

There has already been started an undercurrent of thought and of movements that would place American institutions on a basis of socialism. When this happens, the medical profession will find itself included in the new socialistic order. From that day on the value of the members of the profession to their fellow men is going to decrease. The great advances in medicine have come in those countries where men have been free. Wherever socialization and regimentation of medicine have occurred, the fine spirit of the members of the profession has been dulled. To take from these men their

independence and to place them in a stratified society of workers is to take from them the innate desire to better their services to humanity.

If we passively accept the dictates of political schemers and close our eyes to the need of closer cooperation and to the need of better control and distribution of medical services by the members of the profession themselves, we shall no longer find our profession the inspiring challenge that it now is. We must take the initiative in any case in which the interests of the profession are endangered. We must pioneer a movement within the medical circle itself to bring to all members of this country, rich and poor, the adequate medical service that is within the power of the profession to provide. Only by removing all sources of criticism of the practice of medicine today shall we be able to keep the practice of our profession under our own control and thus maintain the high standards of service and advancement that have been the pride of the profession in the past.

With this in mind, we, as medical students, have a solemn responsibility above that which was borne by the men of medicine in the past. We not only must maintain our medical art on the high plane on which they bequeathed it to us, but we must further the unification of the profession to a degree never yet attained. We must begin now to make ourselves strong; strong not only in our comprehension of the purely medical aspects of the profession but strong in our knowledge of the relationship of medicine to the structure of society as a whole and strong in our convictions of the true and proper course that we must follow to realize our present ideals.

THE FUNDAMENTAL SCIENCES

Abstract of Lecture by Dr. Anton J. Carlson, of the University of Chicago, at the fiftieth anniversary of the founding of the University of Minnesota Medical School, published in the Minnesota Alumni Weekly, Jan. 27, 1940.

The earliest accounts we have of man trying to understand himself and the universe deal with astronomy and with human sickness. The earliest, sporadic achievements in medicine, such as the use of quinine against malaria by the South American Indians and vaccination against smallpox by the Chinese several hundred years before Jenner, were steps in the control of, rather than in the understanding of, disease. Galen was on the right road, but he had few real followers for a thousand years. Hence, medicine in the sense of discovering the causes of human ills dates back only a few hundred years. And the achievements in medicine closely parallel the progress in the fundamental sciences of biology, chemistry and physics. The reason is that biology, chemistry and physics have furnished many of the data, the hypotheses and the tools necessary for the next step in the fight against disease.

Human anatomy, animal physiology, biochemistry, bacteriology and pharmacology are historically the legitimate offspring of medicine. Perhaps it would be more correct to call biochemistry an adopted child—adopted from chemistry. They are now an integral part of modern medical education, medical practice, medical research and hence included in the term medicine. But physiology, at least, is as important in our secondary and college education as it is in medical education. Education means understanding. Health education means understanding the living body, the living machinery of man, the known causes of disease or ill health and the known ways of keeping fit. This is the contribution of the medical sciences to primary and general education in our democracy.

What about botany and zoology? In the first place, the plant groups bacteria and fungi are common agents of human disease. But, more fundamental still, the essential machinery of reproduction, growth, nutrition, respiration, heredity and death is the same in the plant and in man. The plant is subject to disease and death, much as man, from defective heredity, malnutrition, poisons, bacteria, animal parasites and viruses. Plants take up from the soil and concentrate in their seed and other structures substances toxic to man, such as selenium and fluorine. Man secures much of his food from the plant kingdom, and the quality of that food is of great significance to human health. Medicines such as quinine, ephedrine and digitalis are manufactured by plants. But perhaps it is in the studies in cell life, on the machinery of heredity and on the mechanisms of immunity to disease in plants that botany attains its greatest significance to human medicine. So the botanist is to the physician a fellow worker.

We have been puzzled by the seemingly abrupt and adult appearance of the hormone machinery, specifically beginning with the vertebrates. The riddle has been solved in the last ten years by the plant physiologists. Many of these hormones are present in the tissues of the plant. In the vertebrates their production has become confined to specific organs or glands. It is no longer so perplexing to find that the pussy willow produces chemical messengers not so different from those produced by the ovaries of women and the testes of men.

Man can get tuberculosis and undulant fever from the cow and the goat, trichinosis from the hog, glanders from the horse, Asiatic plague from the gopher and the rat, tularemia from the rabbit, tapeworm from the fish, spotted fever from the wood tick, malaria and yellow fever

from the mosquito, typhus from the louse and psittacosis from the parrot, and this is not the end of the list. Man is an animal. Some people believe, others hope, he is also something more. There may be uncertainty as to facts in biologic evolution, but the essential identity of the brain, the heart, the intestine, the lungs, the liver and the kidneys of man and the animals is certain.

Unfortunately we do not transmit our own understanding and knowledge with our germ plasm. We can give our children only the capacity and the facilities to learn. No matter how great our medical knowledge today, our children of tomorrow start at zero. So each generation of medical students must secure its fundamental training in the nature of health and the nature and control of disease on the animal, living and dead. The fundamental experiment of the immortal Pasteur was on sheep. Some human ailments cannot at present be diagnosed with certainty without resorting to tests on living animals. The mouse and the rat, the guinea pig and the monkey are necessary material in the modern medical school, the modern hospital, the modern medical research institute.

Preventive medicine is the natural child of fundamental medical research and social statesmanship. Some progress is being made with smallpox, typhoid, malaria, tuberculosis, syphilis and dietary deficiencies, but the perplexities confronting the students of nationwide disease prevention today seem as discouraging as did the control of individual sickness to the doctor of a hundred years ago. Ignorance, irresponsibility, poverty and greed are formidable obstacles to the health of the individual. Nationwide these seem insurmountable except to the few of us who may be killed but never conquered. This program involves a high level of education and sense of social responsibility on the part of every citizen. It involves adequate food production (hence agriculture) and distribution (hence commerce), adequate housing, adequate work for all who can and will strive, and the sterilization of those who cannot and will not do their share of the world's labor.

CHEMISTRY

The same chemical substances and chemical energies operate in man and in the rest of the universe. We owe to chemistry many of the methods necessary in the isolation, analysis and comprehension of the processes of health as well as of disease in the identification of chemicals that cause disease, in the manufacture and purification of chemicals that aid both in the prevention and in the cure of disease. The microscope revealed the cell as the present unit of life, but it remained for chemistry to reveal its composition and its energies. Picture where the physician and his patient would be without our present knowledge of the chemistry of respiration, of foods and digestion, of blood and urine, of growth, of hormones, of bacterial toxins and immune bodies, of such important remedies as insulin, arsphenamine, sulfanilamide and vitamins.

PHYSICS

The line separating chemistry from physics is faint. These two sciences unite in probing the atom, in harnessing the electron, and every chemical change has physical concomitants. The human eye, the human ear are in fact physical machines, worked by the physical forces of light and sound. The discovery of electrical energy did more for biology and medicine than it did for industry. The roentgen ray is nearly essential in the diagnosis of gastric ulcer, tuberculosis, tumors, rickets, brain abnormalities, diseases of the gallbladder, the kidneys, the heart and the blood vessels. A physicist told me that in his opinion all physicists should abandon research in pure physics and for the next generation focus their brains on biology and medicine. That would be a mistake. Let a Compton and a Millikan continue to capture the elusive cosmic ray. In the long run that will be of greater service to medicine than if such men, almost innocent of biology, should turn their attention to cancer. We need more brains in every science.

But the chemist and the physicist have an easier task than the physician. In their dealings they are the least hampered by the human equations of ignorance, superstitions and misunderstandings of his fellow man. Not so the doctor. Medical education and medical research are becoming increasingly complex, time consuming and costly. The conscientious practice of modern medicine is becoming so complicated and costly as almost to exceed the intellectual capacity of the ablest men. I see no cure for this. No university will be able to maintain a medical school of distinction without great men also in biology, chemistry and physics.

FIRST RATE MEN

I would put first things first in this field, and that is able men. I have listened to endless discussions on the medical curriculum. I have seen drives for bigger and better teaching and research hospitals, bigger and better teaching and research laboratories. I have listened to plans for "coordination of research" from people who do not have their milk teeth of research. Talk comes easy. But real medical research and conscientious medical practice take everything that the ablest of us can deliver. It is not a schedule of forty hours a week but a sweating proposition of eighteen hours a day. Look at the piles of brick, steel and stone towering on almost every college campus the last ten years, largely through federal funds. How many farthings have been invested in men in these institutions, in first rate men? Big

buildings and small men have never made great institutions. But big men have frequently added mightily to our understanding of life in health and in disease, in primitive surroundings and with meager equipment.

DEDICATION OF THE YALE MEDICAL LIBRARY

The new medical library of Yale University Medical School, New Haven, Conn., was formally dedicated on June 15. The dedicatory address was delivered by Dr. John Homans, former member of the Yale University Medical School faculty and now clinical professor of surgery at Harvard Medical School, Boston. The opening of this library, Dr. Homans said, commemorates the gift to the Yale School of Medicine of the late Dr. Harvey Cushing's great historical collection. The collection and study of books was a fascinating avocation to Dr. Cushing into which he put as much time as could be spared. This interest was aroused in part by Dr. Cushing's early association with William Osler and in part by a gift by W. G. MacCallum of a 1543 copy of Fabrica of Vesalius and by another 1555 edition presented to him by Howard A. Kelly. For years Dr. Cushing kept behind his desk a small case in which he put books that he referred to as "science firsts." While cataloguing these books at odd moments, the idea came to him of writing to the men who had or were making great contributions to science to ask for reprints of their publications. He first wrote to the list of Nobel prize winners and then used his judgment to select the younger men who he thought some day might belong to that group or a similar one. Many of these contributions are now in the Yale Library, and some day Cushing's correspondence in these matters will make a fascinating record. Dr. Homans said that Cushing often had great ideas but he did not readily transmit them to his associates. He found it difficult to delegate to others the working out of a plan, and he could not shake off routine. He paid meticulous attention to details in even the final stages of surgical operations and to prolonged examinations and the dressing of patients. He held himself to a high standard in everything he did. He even wrote in longhand at first and then by corrections and insertions and transpositions in the typewritten manuscript, producing in his characteristic graceful handwriting an unforgettable manuscript. One of his most brilliant essays was "The Doctor and His Books," which was delivered at Cleveland. Cushing was primarily an artist, imaginative, creative, energetic and determined. Few writers attain so consistent a standard of charm in style and expression, although at times he would produce labored sentences. Cushing was at his best when writing of books or of romantic episodes or of beloved and admired friends. The remainder of Dr. Homans' address pertained to several of the larger medical libraries of this country. As a memorial the class of 1891 presented the rotunda, which Dr. Starling W. Childs in his presentation speech said is a fitting monument to Dr. Cushing for it is the center of the medical library and is a symbol of his life, character and medical career. The library and the rotunda and other gifts of endowment and equipment were accepted by the president, Charles E. Seymour of Yale University, who gave them over into the hands of the dean of the school of medicine, whom he charged with their care. Dr. Francis G. Blake, dean of the medical school, accepted the library and its many treasures for the school of medicine. In this building, he said, in almost unique proximity, are now assembled exceptional collections of the classics of medicine and also ever growing collections of books and journals which give expression to the truths and fancies of medicine of today, which perchance may become classics of a more enlightened future. Harvey Cushing, he said, was the moving force in launching the plans which had now come to fruition. Cushing's conception of the proper influence of a library was in part expressed as follows: "To quicken the dormant book so that it may speak again; and with those who treat it lovingly and compassionately its spirit enters eagerly into communion. To these a library becomes a laboratory for the crystallization of ideas perhaps long expressed, out of which process new ideas have their birth." The master of ceremonies, Wilmarth S. Lewis, chairman of the Yale Corporation's Committee on the Library and Museums, told of the development of the idea of "The Institute," which was to be the libraries of Drs. Cushing, Klebs and Fulton, which they would give if the university would put up a building for them. Just before Dr. Cushing's last illness, Mr. Lewis was able to tell him that all plans had been made and that ground shortly would be broken for "The Institute."

DO YOU KNOW WHAT PHYSICIAN—

1. Was the first physician to practice inoculation for the prevention of smallpox in America?

2. Was the first to introduce into the United States vaccination for the prevention of smallpox?

(The answers are on page 1136)

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items for consideration for publication in the Student Section.

Illinois to Remain Open Twelve Months a Year

The board of trustees of the University of Illinois has approved the operation of the medical school of the university twelve months out of the year. Heretofore, the medical school has been operating on an academic year of nine and one-half months. The trustees also authorized an increase in the freshman medical class from one hundred and fifty-five to one hundred and sixty-five students, and in the junior class from one hundred and forty-nine to one hundred and sixty-five, by acceptance of sixteen transfer students. Next year, it is reported, summer classes will be provided for fourth year medical students.

Wayne Admits Ten Additional Freshmen

Because of defense needs, Wayne University College of Medicine, Detroit, has made special arrangements to accommodate ten more medical students than customarily are admitted each September. The Welcome Day program, September 10, for the largest freshman class in seven years was in charge of the medical college student council. The program was arranged by the council president James Doty. After the program, the new class made a tour of the college buildings and visited the hospitals and the board of health laboratories.

California Students to Be Offered Influenza Vaccine

Last year influenza was the cause of more hospitalization among University of California students than any other factor. This year Dr. William G. Donald, university physician, announces that one thousand students will receive influenza vaccine in the hope that it will reduce the incidence of influenza among the students. The vaccine, which was given to the university by the research laboratory of the state department of health, was developed by the laboratory of the International Health Division of the Rockefeller Foundation. Type A vaccine will be administered, as that was the type of influenza prevalent last year among the students.

Three Students Win Harvard's National Scholarships

The three outstanding candidates for admission to Harvard Medical School this fall as recipients of national scholarships offered by the school are Gaston E. Blom of Tuckahoe, N. Y. (A.B. Colgate University '41); William F. Ketchum of Evanston, Ill. (A.B. Harvard '41), and Frederick R. Gilmore of Bloomsburg, Pa. (A.B. Lehigh University '41). Winners of these scholarships who maintain honor records continue to hold the awards until graduation. This is the fifth year of Harvard Medical School's national scholarship plan, which was introduced by President Conant in Harvard College in 1934 and subsequently has been adopted by some of the other Harvard schools.

In addition, Harvard Medical School has awarded scholarships and fellowships for the next academic year totaling $6,860, to Harold D. Rosenbaum of Fair Play, Ky.; Carl T. Nelson '42 of Jamaica Plain, Mass.; William E. Watts '42 of Seattle; Victor C. Vaughan III '43, Richmond, Va.; Israel H. Scheinberg '44, New York; Eugene R. Sullivan, M.D., assistant in medicine, Massachusetts General Hospital, Boston; Walter E. Knox III, '43, McCook, Neb.; William F. Pollock '44, Santa Monica, Calif.; Hebert R. Morgan '42, Bell, Calif.; Stuart G. Quan, Oakland, Calif.; Henry S. Fuller, Washington, D. C., and Ping-Yang Liu, M.D., research fellow at Harvard Medical School.

Maryland Graduates Inaugurate Fund for Needy Students

Each member of the 1941 graduating class of the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, gave $1 on graduation and promised to give $1 a year thereafter to support alumni scholarships to aid needy medical students. In fulfilment of the promise, ninety-two members of the last graduating class gave $126 to the treasurer of the alumni association. The announcement was made at the alumni banquet by John E. Esnard, president of the graduating class. Dr. Charles Bagley Jr., then president of the alumni association, announced that the other classes in the medical school were planning to make this action of the class of 1941 a tradition.

Indiana Adds Twenty-Five Acres to Campus

The extent of the campus of the Indiana University Medical Center, Indianapolis, was increased from fifty to seventy-five acres June 26 by the purchase of land and a trade with the Board of Park Commissioners of Indianapolis. The Riley Memorial Association acquired eighteen acres northwest of the Convalescent Home of Riley Hospital and five acres in front of the main hospital building from the city park department in an exchange for lots in another part of the city which had been bequeathed to the Riley Hospital by the late Edmund Zoller. In addition to this, Riley Association bought twenty-three lots from private owners. The expansion of the campus will give the medical center protection against encroachments and provide ultimately for the erection of a research building. For the present, the new lands will be cleared and landscaped. The opportunity to acquire the land was made possible by the contributions of philanthropic citizens who had contributed to the medical center.

The Schering Award

The Association of Medical Students is sponsoring a scholarship competition among medical students for the best dissertations on the history of endocrine research. Full scholarships of one year and one-half year will be awarded. The scholarships have been donated by the Schering Corporation to the Association of Medical Students in order to encourage interest in endocrinologic developments. Any medical student matriculated in a medical school in the United States or Canada is eligible to compete. Graduate students are not eligible. Senior medical students are eligible with the understanding that they will be awarded, if successful, an equivalent scholarship for graduate study or the cash equivalent of the scholarship, at the option of the medical student. A student may submit as many manuscripts as he desires, typewritten and double spaced on one side of the paper only and varying from 5,000 to 10,000 words, although this restriction is not absolute. The material presented should be completely and properly documented by reference to the literature. Manuscripts will be received up to Nov. 15, 1941.

The successful candidates will be announced in December, at which time the prizes will be awarded. Manuscripts, notices of intention to participate and other communications should be addressed to the Committee on the Schering Award, Association of Medical Students, 25 Madison Square North, New York. The judges will be:

H. M. Evans, professor of anatomy and biology, Institute of Experimental Biology, University of California.
E. C. Hamblen, associate professor and chief of the Endocrine Division, Department of Obstetrics and Gynecology, Duke University School of Medicine.
R. G. Hoskins, director of the Memorial Foundation for Neuro-Endocrine Research, Harvard Medical School, and editor emeritus of Endocrinology and of the Journal of Clinical Endocrinology, official organs of the Association for the Study of Internal Secretions.
F. C. Koch, chairman of the department of biochemistry, University of Chicago.
Hans Lisser, clinical professor of medicine, University of California Medical School.
E. P. McCullagh, of the section on endocrinology and metabolism, the Cleveland Clinic.
C. R. Moore, professor of zoology, department of zoology, University of Chicago.
Emil Novak, associate professor of obstetrics, University of Maryland School of Medicine and College of Physicians and Surgeons.
E. L. Sevringhaus, professor of medicine, University of Wisconsin Medical School.
Ephraim Shorr, assistant professor of medicine, Cornell University Medical College and the New York Hospital.

Louisiana's Bel Award

The dean of Louisiana State University School of Medicine, New Orleans, Dr. Beryl I. Burns, announced that Dr. Spurgeon M. Wingo, who graduated on June 2, received the George S. Bel Memorial Award of $50, which is presented annually to the fourth year student who symbolizes the highest ideals of medicine as demonstrated by "scientific interest, ethics, personality, tact, bedside manner, ability to handle people, kindness to patients, clinical ability, and an aim to serve humanity rather than mercenary ambitions." The winning student is selected from the highest ranking fourth year students by a faculty committee. Dr. Wingo will serve his internship in the U. S. Marine Hospital at New Orleans.

College of Medical Evangelists

At the College of Medical Evangelists, Los Angeles, May 4, the sophomore class was host at a homecoming at the Loma Linda division in honor of the junior and senior classes which included a field day of sport events, a picnic supper and a program in the open air amphitheater. The annual picnic of the alumni of the school was held May 11. Prizes were offered to the participants in the sport events and contests. Concerts were given again this year by the Bards, a male chorus consisting largely of medical students and interns under the direction of Dr. Clemen Hamer. At a recent meeting of the board of trustees, plans were laid for the erection of a new dormitory to house the freshman and sophomore men at the preclinical division at Loma Linda.

Georgia Classroom Buildings to Be Enlarged

The board of regents of the University of Georgia announced in August that it would receive bids, September 8, for the enlargement of the classroom buildings at the School of Medicine at Augusta and that the buildings then would accommodate an increase of 50 per cent in the student body. The present classroom facilities will accommodate only fifty-one freshmen students. The estimated cost of this work together with other equipment would be $165,000.

Wayne University's Annual Awards

At the annual banquet of students and faculty at Wayne University College of Medicine, Detroit, May 24, Dr. Ralph M. Waters, professor of anesthesia at the University of Wisconsin Medical School, Madison, gave an address on the history of anesthesia. The following awards were presented: Alumni Senior Scholarship Award of $50 to Charles E. Stebbins '42; Student Merit Award to Mark Dale; Distinguished Service Medal to Dr. Frederick F. Yonkman, professor of pharmacology and therapeutics, and a gold watch presented by faculty members to retiring professor of pathology Dr. James E. Davis.

The glee club of the college of medicine presented its first public concert, May 23, to a large audience. Mr. Leroy W. Jahnke will continue as director of the club.

At the student-faculty convocation, May 23, Mr. James R. Doty '42, president-elect of the Student Council, presented to the dean on behalf of the Student Council oil portraits of the following pioneers in medical education at Wayne University: Drs. A. P. Biddle, W. H. MacCracken, W. J. Stapleton, William Donald and Burt R. Shurly. The artist was Mr. Leon A. Makielski.

Prizes Awarded to Long Island Seniors

At the commencement day exercises at the Long Island College of Medicine, Brooklyn, June 5, at the Brooklyn Academy of Music, the address was delivered by Harry D. Gideonse, president of Brooklyn College; the administration of the Hippocratic Oath was by Dr. Alfred E. Shipley, professor of preventive medicine; the presentation of candidates by Dr. Jean Alonzo Curran, dean, and the degrees were conferred by Dr. Frank L. Babbott, president of the college.

Prizes and medals were awarded to the following members of the graduating class:

Joseph David Feldman, the Dudley Medal, for the best clinical report of a case in the medical wards of the Long Island College Hospital.
James T. Smith, the Dudley Memorial Medal, for the best clinical report of a case in the surgical wards of the Long Island College Hospital.
Thomas G. Morrione, the Mitchell Prize, to the graduate who in the judgment of the faculty is best qualified in all departments of medicine.
Mary-Light Schaeffer Cassidy, the Ford Prize, for the best dissection.
Thomas J. Dunne, the Obstetric Prize, for the best thesis on an obstetric subject.
Regina V. Gilroy, the 1898 Class Prize, to the student whose scholastic average in the fourth year showed the greatest improvement over that of previous years.
Arthur G. Hopkins, the Alumni Prize, to the student best qualified in gynecology.

Intramural Contests at Tennessee

The end of the annual series of intramural contests at the University of Tennessee, Memphis, was marked by the presentation ceremony at the University Center, May 9. Trophies were awarded to the winning groups of students and awards were made to the retiring intramural managers and student body officers. Earl Best, Knoxville, Tenn., sophomore in the school of medicine, is president of the student body for 1941-1942.

Annual Banquet at Indiana

Dr. Chester A. Stayton, Indianapolis, addressed the annual banquet of the Phi Beta Pi medical fraternity at the Indiana University School of Medicine, Indianapolis, April 9, on "Choosing Medicine as a Career"; Dr. Lewis C. Robbins, Bloomington, discussed "Non-medical Activities," and Dr. William V. Woods, Indianapolis, spoke on "Choosing a Medical Fraternity."

Premedical News

Alpha Epsilon Delta, honorary fraternity for premedical students, has thirty-one chapters in colleges and universities throughout the country, the newest chapter having been inaugurated March 8 at the University of Detroit with twenty charter members. The Ohio State University College of Medicine, Columbus, Alpha chapter, was addressed May 9 by Dr. Walter Reckless of the department of sociology on the relation of criminology to the problems of medicine and on April 24 by Dr. Jack Harris of the department of sociology on the relation of anthropologic studies to medicine. The chapter awarded a $50 prize for the winning paper in the fraternity essay contest at the June commencement; the prize was awarded by the president of the university. Members of the Missouri Alpha chapter have been constructing in their spare time for the last two years a club cabin on Brockman's Lake, near Fayette, and expect to have the cabin completed and ready for meetings and week-end outings next year. The Oklahoma Alpha chapter will present an award of $50 to the outstanding premedical student who will enter medical school next fall. The award will be based on scholarship and leadership. The members of the California Alpha chapter visited the Children's Hospital in Los Angeles recently, where they observed a demonstration on the electroencephalograph, an instrument used in the diagnosis of brain tumors.

Virginia

Dr. Fuller Albright, Boston, recently delivered the Brown-Séquard address at the Medical College of Virginia under the auspices of Alpha Omega Alpha.——Dr. Eugene M. Landis, Charlottesville, lectured on "Capillary Physiology and Fluid Balance" as the guest of Sigma Zeta.——Phi Beta Pi sponsored a lecture by Dr. Walter E. Vest, Huntington, W. Va., on "Some Medical Aspects of Shakespeare."——Drs. Walter Freeman and James W. Watts, Washington, D. C., discussed "Prefrontal Lobotomy in Mental Disorders" before the University of Virginia Medical Society, Charlottesville.

Arkansas

The newly elected officers of the student body of the University of Arkansas Medical School, Little Rock, are Peter O. Thomas, Little Rock, president; Joseph W. Ledbetter, Jonesboro, vice president; Robert W. Ross, Little Rock, Secretary; Arnold H. Gould, Bloomfield, N. J., treasurer. All of the new student officers will be seniors next year.

Lecture on Medical Ethics

The sophomore class of the University of Alabama School of Medicine, University, Ala., was addressed by Dr. Seale Harris Jr., Birmingham, on medical ethics. Dr. Harris also distributed to the members of the class the code of ethics of the American Medical Association.

Phi Rho Sigma

Delegates from all chapters of the Phi Rho Sigma medical fraternity held their annual four-day convention at Lake Wawasee, Ind., in June. Dr. Stuart Wilson, Detroit, past president of the fraternity, delivered the keynote address; much time was given to consideration of the role of the medical student in the national defense program. Dr. Jonathan Forman, Columbus, Ohio, was reelected president; Dr. Norman M. Macneill, Philadelphia, vice president; Dr. Ralph W. Elliott, Cleveland, reelected secretary-treasurer.

Four Year Course in Pharmacy

The University of Illinois College of Pharmacy announced, July 18, the establishment of a four year course in pharmacy, supplanting a three year course which had to be preceded by one year of college work. Henceforth, students may be admitted directly from high school. In the final two years of the four year course there will be five fields of specialization offered: retail pharmacy, hospital pharmacy, pharmaceutical chemistry, pharmacology, and food and drugs. The College of Pharmacy begins its eighty-second year this fall, having been founded in 1859 as the first school of pharmacy west of the Alleghenies. It became part of the University of Illinois in 1896.

National Board Questions in Biochemistry

Following are the questions used by the National Board of Medical Examiners in Biochemistry in part I of the examination held February 12-14: (Part I of the examination is given at the end of the first two years of the medical curriculum.)

Answer any five questions. Wherever possible, give formulas for the compounds discussed:

1. The *pH* of the blood is normally maintained within a narrow range while that of the urine varies considerably. Explain.
2. Discuss briefly the ultimate fate of any three of the following substances in the normal human subject: (*a*) lactic acid, (*b*) alanine, (*c*) benzoic acid, (*d*) nucleic acid.
3. What is meant by "nonprotein respiratory quotient?" What information may be obtained from it?
4. Discuss the chemistry and the nutritional value of milk.
5. Name and give the origin of the sulfur-containing compounds found in urine. To what extent may the composition of the diet influence both the amount of these urinary sulfur compounds and their percentage distribution?
6. Define a lipid. Name two important phospholipids and discuss the chemistry and probable function of each.
7. Discuss the functions and the daily human requirements of two of the following elements: sodium, potassium, iron, iodine.

"DO YOU KNOW WHAT PHYSICIAN"

Following are answers to the questions appearing on page 1133:

1. Zabdiel Boylston (1679-1766). Dr. Boylston was the son of Dr. Thomas Boylston of Muddy River, which is now Brookline, Mass. According to Fielding H. Garrison in his "History of Medicine," Dr. Boylston during the sixth epidemic of smallpox in Boston inoculated his own son and 2 Negro slaves and before the epidemic closed had inoculated 244 persons, exciting great opposition and threats of hanging. Dr. Boylston spent two years in London, where he lectured to the Royal Society of Physicians and was elected a fellow of the Royal Society in 1726. Among other publications he made a joint contribution with Rev. Cotton Mather in 1721 entitled "An Historical Account of the Smallpox Inoculated in New England."

2. Dr. Benjamin Waterhouse (1754-1846), who went to England in 1775 and studied with Dr. Fothergill and later went to Edinburgh for lectures and hospital experience. He studied at the University of Leyden for four years, taking a degree in 1781, and in 1782 began the practice of medicine in the United States. He was the first professor of theory and practice at Harvard Medical School, Boston. In 1799 he received from London a copy of Edward Jenner's "Inquiry into the Causes and Effects of the Variolae Vaccinae or Smallpox," and on July 8, 1800 vaccinated his own son and later vaccinated other members of the family. These persons later were inoculated with variolous matter by another physician in Brookline, and none of those inoculated contracted smallpox. At Dr. Waterhouse's suggestion a public experiment was undertaken in East Boston in which children were first vaccinated and later inoculated for smallpox, and this experiment proved conclusively that cowpox is a complete security against smallpox.

Book Notices

Research—A National Resource. II.—Industrial Research. December 1940. Report of the National Research Council to the National Resources Planning Board. Paper. Price, $1. Pp. 369, with 104 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This report is a thrilling mystery story of how scientists unmasked saboteurs of progress and uncovered the secrets of materials, forces and personnel that blocked industrial advance. The first research scientists were often "amateurs," "gentlemen of leisure" or university professors usually interested in "pure" science. High rewards for successful discoveries caused investigators to multiply, until in 1940 2,330 companies "reported 70,033 persons engaged in technical research in the United States," an increase of 41 per cent since 1938. There was a sharp decline in industrial research departments in industry from 1929 to 1932. There are some indications that research, especially for all but the industrial giants, is returning to educational and technical institutions, which always are the main source of research personnel. When industrialists as well as chemists, physicists and physicians find ways to use the results of research in atomic disintegration, the distinction between "pure" and "applied" science disappears. Leading scientists tell in this report how governments, universities, industries, laboratories, associations, academies and a multitude of scientific organizations and publications are exploring the frontiers of knowledge and classifying, organizing, synthesizing and redistributing the new found facts for researchers. There is the story of how the utilization of discoveries is transforming human lives, of how scientific progress is dependent on freedom and withers under totalitarian tyranny, and how the future of the world may depend on the use of research in war.

The Political Life of the American Medical Association. By Oliver Garceau. Harvard Political Studies. Cloth. Price, $2.50. Pp. 186. Cambridge: Harvard University Press; London, Oxford University Press, 1941.

Mr. Garceau is apparently a naive young man in the Department of Government of Harvard University. The volume here reviewed was published with the aid of the Louis Adams Frothingham Fund as one of a series of Harvard Political Studies. A list of acknowledgments indicates that the author was advised by Dr. Hugh Cabot and by his late uncle Dr. John Lovett Morse, neither of whom, on the basis of their intimate experience, could speak with any authority on the internal affairs of the organization concerned. Mr. Garceau seems to have been somewhat helped by correspondence with a few secretaries of state and county societies and with the Secretary of the American Medical Association. There is not the slightest evidence that he made any attempt at any time actually to visit a session of the House of Delegates or the headquarters of the American Medical Association or to confer personally with any officials of the organization or employees who could have enlightened him about many matters which are obviously to him quite obscure and about which he is exceedingly confused. He has had some contact with printed proceedings and with THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and he seems on occasion even to have been unable to read accurately or to interpret correctly what he read. With these gentle comments it remains only to say that he endeavors to portray a picture of the organization, to find in its constituency an active minority, to determine the significance of recent debates having to do with social and socialized medicine. He concludes after a completely inadequate examination of but a small portion of the available evidence that the American Medical Association owes to itself and to the public a better performance than it has recently achieved. He seems to think that the internal politics of the Association are at fault and that a two party system in the House of Delegates would help to solve some of the problems. His final chapter, on "Political Ecology," is the most confused of all the chapters in the book. Obviously Mr. Garceau, with the inadequate survey that he has made of the situation, blows hot and cold alternately and with a considerable amount of dysrhythmia. To those who have worked in the public affairs of medicine there is much in the book that is interesting, but it throws on the situation that it tries to portray only a blurred and vague illumination. It is difficult to understand why a university department and a university press should lend authenticity to such a volume unless the young man requires a book to his name as a step in the orderly processes of university promotion.

Die Kapillare Angioarchitektonik der isogenetischen Grosshirnrinde des erwachsenen Menschen: Morphologische und quantitative Beziehungen zwischen Anglo-, Zyto- und Myeloarchitektonik sowie einige pathologische Aspekte. Von Åke G. H. Lindgren, M.D., Dozent der pathologischen Anatomie am Karolinischen Institut zu Stockholm. Paper. Pp. 101, with 16 illustrations. Helsingfors: Mercators Tryckeri, 1940.

This is a German translation of a monographic study by a Swedish pathologist. It embodies the results of a thorough investigation of the capillary bed of forty-four cortical areas (thirteen of the frontal lobe, four of the insula, three of the occipital lobe, eight of the parietal lobe, ten of the temporal lobe and six of the lobus limbicus superior). The study, thus, represents the most ambitious attempt to date of mapping out the distribution pattern and relative richness of cortical capillaries through the entire depth of the gray matter in the major portions of the isocortex. To the reviewer's knowledge, complete brain maps of the lateral and sagittal aspects are illustrated for the first time in which the various degrees of differentiation of the capillary pattern are shown, similar to the usual brain maps which emphasize differences in cytoarchitecture. For each chosen area comparisons were made between the capillary angioarchitecture on the one hand and the corresponding cytoarchitecture (after von Economo) and myeloarchitecture (after C. and O. Vogt) on the other hand. Valuable tables are given showing the relative amount of capillaries present in the various laminas of gray matter of all cortical areas studied.

The material consisted of 6 hyperemic human brains, of which thousands of sections perpendicular to the gyri of areas under consideration were made. For the final analysis, however, sections of only 3 of these brains were used, as their capillary system revealed the fullest possible degree of filling with its own blood. The author is skeptical as to the value of artificial injection methods and emphasizes his thesis that "blood (under hyperemic conditions) is the best injection medium." A modified Sjöstrand technic was used for staining the erythrocytes in the capillaries. This is essentially a benzidine-hydrogen peroxide stain. Alternate frozen sections were made of 200 microns for erythrocyte staining and of 25 microns for toluidin staining of neurostructures in strictly comparable fields. The detail technic for establishing capillary length in centimeters per cubic millimeter of gray matter is too involved to be reviewed here. The reviewer has checked calculations and figures given by the author and found the mathematical procedures correct. Throughout the study of the monograph respect for the great amount of work and the careful methods employed by the author is maintained. The author's criticism of conclusions drawn by R. A. Pfeifer is often sharp, although he recognizes the latter generously as the master of the injection method. Likewise, certain basic calculations by von Economo and Koskinas pertaining to the number of neurons in a given unit of gray matter are questioned by the author and evidently justifiably corrected. As a measure for the relative richness in capillaries in proportion to the number of cell bodies in the various cortical laminas the author established an index.

Differences in the capillary angioarchitecture of various cortical areas are usually less than those existing in the cytoarchitecture and myeloarchitecture. Broadly, there is a certain degree of parallelism in the degree of differentiation and detail arrangements (architectonics) between all three elements of cortical structure, although there are many exceptions. The author agrees with Lorente de Nó, Holmes and others that a particularly rich relative amount of capillaries present in a particular lamina (for instance the first) may be related to a great number of synapses occurring at such a level rather than to the presence of particularly numerous neuron cell bodies.

Relatively richest in capillaries, as compared to cell content, is the first lamina. Second place in relative richness of the capillary bed is taken by lamina 6b. Fairly constantly the fourth and second laminas are in the last position in their richness of capillaries relative to their cell content. This is undoubtedly due to the extraordinarily high cell content of

the outer and inner granular layers even though the absolute capillary supply of the fourth lamina is rather high. In their relative capillary content the remaining laminas occupy an intermediate position between the extremes mentioned.

The author's remarks concerning the practical applications and possible significance in pathology are brief. The literature is adequately reviewed, but fortunately the bulk of this monographic study is concerned with original observations. It is only to be regretted that the little book is not as well illustrated as, for instance, R. A. Pfeifer's similar study of the angioarchitecture of the cortex of the cat. There are sixty bibliographic references.

Synopsis of Diseases of the Heart and Arteries. By George R. Herrmann, M.S., M.D., Ph.D., Professor of Medicine, University of Texas, Galveston. Second edition. Fabrikoid. Price, $5. Pp. 468, with 91 illustrations. St. Louis: C. V. Mosby Company, 1941.

This edition has added one hundred and twenty pages of important new information including three new chapters, one on peripheral vascular disease, another on military cardiovascular examinations and interpretation and a third on cardiovascular risks in surgery and obstetrics. The number of illustrations has been increased; the three color plates have been retained.

This volume can be heartily recommended for perusal by medical student or general practitioner. It can, however, hardly be referred to any longer as a brief handbook or synopsis intended for the hard pressed medical student or the very busy practitioner. It has grown to be a volume of intermediate size, though all the more valuable as the result, provided the doctor will take the extra time to read it.

It is naturally difficult in such a volume to suit every one's idea of a perfect balance between the various features discussed; for example, between methods of examination on the one hand and the course, diagnosis and treatment of disease on the other. No two persons would agree completely as to what a perfect balance is. The book seems to be overweighted a little in favor of details of methods of examination. A few subjects might well be amplified somewhat in a later edition, particularly rheumatic heart disease, congenital defects and constrictive pericarditis. In chapter 1 the definition of the diagnosis of heart disease should include evidence of valvular involvement as well as of involvement of the heart muscle, and less emphasis should be placed on the seriousness of the verdict of heart disease.

One of the chief reasons for the need of such volumes by the practitioner of medicine is expressed by the author as follows:

> Unfortunately, more uncertainty exists and errors are probably more often made in the diagnosis of diseases of the cardiovascular system than in disorders of any other system. The conscientious practitioner finds himself less confident in matters pertaining to the heart and blood vessels than he is in other fields of medicine. This state of affairs is dependent primarily upon the persistence of a few fundamental misconceptions. The first is that the presence of any one of the so-called cardiac symptoms —namely, shortness of breath, edema and pain—or the presence of any murmur spells heart disease. Secondly, it is just as fallacious to feel that every heart over which no murmurs can be heard is essentially healthy and normal. Thirdly, the idea that every irregularity or disturbance of the heart mechanism indicates myocardial damage is wrong. Fourthly, if the heart rhythm is regular and slow, it does not necessarily follow that the myocardium must be fundamentally sound. The fallacy of such conceptions should be obvious.

With this point of view, and hence in the need of such volumes, the reviewer heartily concurs.

Sammlung psychiatrischer und neurologischer Einzeldarstellungen. Herausgegeben von Prof. Dr. A. Bostroem and Prof. Dr. K. Beringer. Band XVI: Krankheitsverlauf, Persönlichkeit und Verwandtschaft Schizophrener und ihre gegenseitigen Beziehungen. Von Dr. M. Bleuler. Paper. Price, 9 marks. Pp. 149, with one illustration. Leipzig: Georg Thieme, 1941.

The writer investigates the correlation between the family predisposition of schizophrenic patients, the course of the disease and the prepsychotic personality with the types of mental disease in relatives. The investigation is based on the histories of 316 schizophrenic patients with family histories of 11,410 relatives. One hundred of these patients, with 2,634 relatives, were studied at the Bloomingdale Hospital in New York. The rest of the patients were studied in the various mental institutions in Switzerland. The author gives the statistical results and finds that schizophrenia is more frequent among the relatives of schizophrenic patients than in the total population. Conditions such as mental deficiency and alcoholism are not encountered more frequently in families of schizophrenic patients than in the general population. When schizophrenia reaches a stationary state, the result is recovery in half of the cases and dementia in the other half. Schizophrenia tends either to have a chronic course or to come in episodes, and the latter is more frequent than the former. In the schizophrenia which tends to run in episodes, only a small minority results in dementia. Most of the patients recover with some degree of defect. The cases which tend to have a chronic course usually terminate in dementia. An investigation of the prepsychotic personalities of the patients showed that one third were definitely odd, peculiar and psychopathic. One fourth of the patients showed no evidence of any maladjustment; another fourth of the patients showed that they were definitely within normal limits. There seems to be no relationship between the severity of the schizophrenic breakdown and the family history. The patients who had unusual personalities had more mentally sick relatives than the patients whose family histories were quite negative. There seems to be a definite relationship between the ages at which the patients break down and the breakdowns of the relatives. There is a much better prognosis for those patients whose prepsychotic personality has been quite normal. Patients with good intelligence have a more favorable prognosis. This is an exhaustive study and the author had the advantage of working in the country, where there is little change in the permanent population and where he had the opportunity of obtaining excellent family histories. Like many such studies, however, it has interesting observations but seems to be no real contribution to the whole problem of heredity in schizophrenia.

Cancer Mortality in the United States. III. Geographic Variation in Recorded Cancer Mortality for Detailed Sites, for an Average of the Years 1930-32. By Mary Gover, Associate Statistician, U. S. Public Health Service. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 257. Paper. Price, 15 cents. Pp. 81, with 18 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

A study was made of the geographic variations in cancer mortality in the United States in which rates for specific sites of cancer were computed from unpublished tabulations made available by the Bureau of the Census. All rates are corrected to a standard age distribution; that is, to the age distribution of the total population of the United States as enumerated in 1930. In this manner, differences in the age composition of different sections of the country are eliminated. Also all rates are computed specifically for sex and color. The following findings are presented:

Recorded cancer mortality varies in different sections of the United States. The range of variation in the rate for all cancer for both sexes is from 127 in Rhode Island to 56 per hundred thousand in Arkansas. A high rate for cutaneous cancer among both sexes was found in the South. There was also a high rate in the South for all sites of cancer of the buccal cavity among females and cancer of the pharynx and mouth among males. Cancer of the breast is unusually low in the South, whereas cancer of the uterus is about average. The states of Wisconsin, Minnesota, Iowa, North Dakota and South Dakota constitute an area where the rates for cancer of the uterus are unusually low. Rates for cancer of the stomach and also the total digestive tract are higher in the Northern sections and in the Pacific than in the West South Central and in the South. Cancer of the respiratory organs is relatively high in the Northeast and Pacific sections.

Mortality from cancer is generally lower among Negroes than among the white, but the rate for some of the specific sites are higher for Negroes. Resident mortality rates for all cancer are highest in large cities, lowest in rural areas and intermediate in smaller cities for the country as a whole and for each of six geographic sections. For each site of cancer, except cancer of the buccal cavity for females and cancer of the stomach and duodenum and of the skin for both males and females, there is a significant positive correlation between the degree of urbanization in states and the magnitude of the death rate for specific sites of cancer. That is, mortality rates for specific sites of cancer are generally higher in states with a large percentage of the population living in cities. This association between

cancer mortality and urbanization occurs apart from the factor of hospitalization.

Correlation coefficients computed for mortality from cancer of the uterus and the birth rate in the states indicate that there are factors, apparently related to urbanization, which are more closely associated with uterine cancer than is the birth rate.

Cardiac Classics: A Collection of Classic Works on the Heart and Circulation with Comprehensive Biographic Accounts of the Authors. Fifty-Two Contributions by Fifty-One Authors. By Fredrick A. Willius, M.D., M.S. in Med., Chief, Section of Cardiology, The Mayo Clinic, Rochester, and Thomas E. Keys, A.B., M.A., Reference Librarian, The Mayo Clinic. Cloth. Price, $10. Pp. 858, with illustrations. St. Louis: C. V. Mosby Company, 1941.

The general plan and the nature of the contents of this noteworthy volume are clearly set forth in its title. Beginning with Harvey's De Motu Cordis, 1628, as translated by Robert Willis, 1847, and ending with Herrick's account of the clinical features of sudden coronary obstruction, 1912, highly representative classic writings about the heart and circulation have been appropriately and faithfully reprinted, with good accounts of the lives of the authors. All translations into English have been selected or made with special care. As a matter of fact about half of the reprints were published originally in the English language. The typography is excellent. The many illustrations, including the likenesses of the authors represented and title pages of their books, as well as drawings and diagrams, all of great interest, have been reproduced. Near the end is a table of correlation of writings now reprinted with contemporary historical events. This table is interesting of course but of limited significance, because as a rule there is no connection other than coincidence between the writing and the event listed. What other connection was there, for instance, between Withering's first treatise on digitalis in 1785 and the recognition two years before of the independence of the United States, or between the death of Charles Dickens in 1870 and the publication that year by Samuel Wilks on capillary embolism? In the preface and again in their recapitulation of the value of the writings included in the book the editors frankly state that they have been especially interested in productions dealing with "the anatomy and physiology of the heart and circulation, descriptions of disease, pathologic and therapeutic contributions, and the like." Hence fields of cardiology are not all equally well represented. One misses, for instance, the reports by Winge and Heiberg (1869-1872), which established the infectious nature of infectious endocarditis. "It has been impossible," the editors explain, "to include all noteworthy contributions of the past in this volume of Cardiac Classics." Does that imply more classics?

Pathology of Rocky Mountain Spotted Fever: I. The Pathology of Rocky Mountain Spotted Fever. II. The Pathologic Histology of Rocky Mountain Spotted Fever in the Rhesus Monkey Macaca mulatta. By R. D. Lillie, Senior Surgeon, U. S. Public Health Service. From the Division of Pathology, National Institute of Health. Federal Security Agency, U. S. Public Health Service. National Institute of Health Bulletin No. 177. Paper. Price, 15 cents. Pp. 59, with 36 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This booklet is divided into two parts: the pathology of Rocky Mountain spotted fever in human beings and the pathologic histology of Rocky Mountain spotted fever in the rhesus monkey. The first portion closes with the conclusion that there is no essential difference in the lesions of this disease whether it occurs in the Rocky Mountain area or on the eastern seaboard of the United States. In summarizing the disease in rhesus monkeys the author concludes that the lesions in these animals closely imitate those found in the same disease in man. The photomicrographs accompanying both sections are good, and this study constitutes an excellent addition to the knowledge of pathology of Rocky Mountain spotted fever.

History of Pharmacy: A Guide and a Survey. By Edward Kremers, Ph.G., Ph.M., Ph.D., and George Urdang, Ph.G., D.Sc.Nat. Cloth. Price, $4.50. Pp. 466, with 30 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1940.

This history of pharmacy is a notable achievement both in history and in pharmacy. As a historical work it is well written, documented and indexed. As for pharmacy it is only the second work of its kind written in this country, but it is difficult to believe that there is anything much better in other sciences. The volume is divided into four parts, the first three tracing the development of pharmacy as a science and a profession; the last is devoted to the contributions of pharmacists to science and society. More than a hundred additional pages are devoted to the bibliography, chronology, glossary and index. The manner in which this supplementary material is treated makes it one of the conspicuous features. The book is too valuable to warrant emphasis on the few errors. However, the reader should not be told that the regulation of advertising is a function of the Federal Food, Drug and Cosmetic Act, as stated on page 202. Dr. Edward Kremers, the senior author, collected source material for this book during his entire professional life. He established in Madison, Wis., a library of materia pharmaceutica which has been characterized as unique in the United States if not in the entire world. With the full time help of Dr. George Urdang, this source material was percolated, distilled and extracted, the active principles going into the book. On the last page the authors write "The members of the profession may derive pride and confidence from the deeds of their great colleagues." This book may be counted among those deeds, and it will stand as a lasting memorial to Dr. Edward Kremers, whose death was announced as these lines were being written.

Radiology Physics: An Introductory Course for Medical or Premedical Students and for all Radiologists. By John Kellock Robertson, F.R.S.C., Professor of Physics, Queen's University, Kingston, Canada. Cloth. Price, $3.50. Pp. 270, with 188 illustrations. New York: D. Van Nostrand Company, Inc., 1941.

This volume is primarily a textbook for students intending to specialize in radiology, radiotherapy or physical therapy. Sixteen chapters and an appendix deal with the production of alternating and direct currents, measurement, roentgen ray tubes, roentgen rays, electromagnetic waves, radioactivity, dosage and artificial radioactivity. Several pages of problems assist the student who wishes to refresh himself on the subject of physical phenomena. The author has tried to use as simple mathematics as possible. The specialist, either student or practitioner, in roentgen rays or physical therapy should find this book useful in his library.

X-Ray Therapy of Chronic Arthritis (Including the X-Ray Diagnosis of the Disease). Preliminary Report Based on 100 Patients Treated at Quincy, Illinois. By Karl Goldhamer, M.D., Associate Roentgenologist, St. Mary's Hospital and Quincy X-Ray and Radium Laboratories, Quincy. With a foreword by Harold Swanberg, B.S., M.D., F.A.C.P., Roentgenologist, St. Mary's Hospital and Blessing Hospital, Quincy. Cloth. Price, $2. Pp. 131, with 26 illustrations. Quincy: Radiologic Review Publishing Co., 1941.

The first seventy pages of this book are devoted to the clinical aspects and pathology of chronic arthritis, roentgen findings in arthritis and the roentgenologic differential diagnosis. The remaining half of the book deals specifically with the history of roentgen therapy for arthritis, the choice of cases for roentgen treatment, case reports and results. The latter part is based on observation and treatment with roentgen rays of 100 patients with chronic arthritis or spondylitis over a period of twenty-one months. The number of cases is therefore not large, and the observation period for a disease of this type is rather short. The authors believe that the results from roentgen treatment have been largely encouraging. Although this method of therapy certainly deserves further study and evaluation, it would seem that the new material contained in this book could better have been published in the form of a preliminary report in a current medical journal.

Studies in the History of Science. By E. A. Speiser et al. University of Pennsylvania Bicentennial Conference. Cloth. Price, $1.50. Pp. 123, with illustrations. Philadelphia: University of Pennsylvania Press, 1941.

This volume includes eight essays delivered at the University of Pennsylvania Bicentennial Conference. The lectures included are:

Ancient Mesopotamia and the Beginnings of Science. E. A. Speiser.
Some Fundamental Concepts in Ancient Astronomy. Otto E. Neugebauer.
Medicine and Surgery in Ancient Egypt. Hermann Ranke.
Medieval Medicine. Henry E. Sigerist.
The Rise of Modern Scientific Medicine. Richard H. Shryock.
Two Centuries of Surgery. Evarts A. Graham.
Logicohistorical Study of Mechanism, Vitalism, Naturalism. Edgar A. Singer.
The Mathematical Way of Thinking. Hermann Weyl.

The nature of the occasion and the repute of the contributors indicate erudite contributions.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SNEEZING MECHANISM AND ALLERGY

To the Editor:—**A man aged 67 has daily paroxysms of sneezing eight to ten times in succession, violent in character and causing exhaustion. They have continued since early life. Climate, food and season do not appear to have any bearing. He is a moderate smoker, enjoying two or three cigars after dinner. The attack, as a rule, follows the evening meal, usually within a half hour. There is no nasal, sinus or throat abnormality and no hay fever. An attack may follow eating an orange or any food which seems to irritate the throat. Will you outline the physiology of sneezing and the probable causes in this case? Also any comments will be appreciated.** William C. Herman, M.D., Cincinnati.

ANSWER.—Sneezing consists of a spasmodic expiration preceded by one or more spasmodic inspirations. The object of the sneezing effort is the removal of irritating substances from the surface of the nasal mucous membrane. The mechanism of sneezing is a complex reflex act and, while there is some difference of opinion on some of its features, one of the common explanations is as follows: Two reflexes are involved, a nasal and a respiratory. The nasal reflex is composed of central cells, located in the medulla; efferent fibers forming the great petrosal nerve, cells of the sphenopalatine ganglion and postganglionic fibers, distributed to the nasal glands and blood vessels; and afferent nerves, comprising cutaneous nerves, nasal branches of the trigeminal and the glossopharyngeal. Stimulation of these afferent nerves, the cutaneous by low temperature or drafts, the trigeminal by chemical, mechanical or inflammatory irritations or by allergic edema, results in impulses to the central cells, followed by activity of the efferent fibers to the nasal mucosa, causing a discharge of mucus. Physiologists differ as to whether the initial stimulus or the mucus is responsible for the next part of the mechanism. Whichever it may be, it excites to activity the afferent nerves, which are the nasal branches of the trigeminal nerves. Stimulation of the inspiratory center leads to increased contraction of the inspiratory muscles (through the phrenic and intercostal nerves) and hence there is a greater depth of inspiration and more air in the lungs. The excitation of the expiratory center causes an increase in intrapulmonic pressure due to contraction of the expiratory muscles and the closure of the nasopharynx and mouth, the former by the bulging forward of the posterior wall of the pharynx and the elevation of the membranous portion of the palate. When the increased pressure reaches a certain point, the nasopharynx is forcibly opened and a draft of air is blown through the nasal chamber. The mouth also opens partially at the same time and allows some of the air to be forcibly expelled through that orifice.

From the foregoing it can be seen that a number of pathologic and physiologic conditions may be responsible for the stimulus initiating the sneezing reflex. Since most of the abnormalities and diseases of the nasal structures and throat have been ruled out in this case, and since the patient has had these paroxysms from early childhood, the most likely conclusion is that one is dealing with a case of allergic irritation. The possible causes are many, including inhalants, foods and even sources of intrinsic allergy. The occurrence of the attacks following the evening meal suggest the further possibility that one might be dealing with an instance of food allergy. In any event a thorough allergic study should be made of the patient by the usual methods.

ROENTGENOLOGIC DEMONSTRATION OF DUODENAL ULCER

To the Editor:—**Can a duodenal ulcer always be demonstrated by roentgen ray findings? In other words, in the presence of full clinical symptoms extending over a period of many years does a negative roentgen examination in the hands of a supposed expert mean no ulcer? Is the blood found in the stools from a patient with duodenal ulcer always of a "tarry" appearance? Is it possible to have dark red blood appear in the stools in this condition?** Paul R. Howard, M.D., El Dorado, Ark.

ANSWER.—Typical ulcer distress is almost diagnostic of active peptic ulcer. Confirmatory roentgenologic evidence of ulcer is directly proportional to the training, skill and competence of the roentgenologist and on his equipment.

The roentgenologic signs of duodenal ulcer are deformity and crater. Deformity is more frequently demonstrated but gives no clue as to whether the lesion is healed or active. Crater demonstration is now recognized as the only roentgenologic evidence of an active ulcer. Templeton, Marcovich and Heinz (Duodenal Ulcer: Value of Roentgenologic Demonstration of Crater, THE JOURNAL, Nov. 12, 1938, p. 1807) state that theoretically it should be possible to demonstrate a crater in 100 per cent of cases of active duodenal ulcer but that actually this is not the case. A crater may be filled with food, débris, blood or granulation tissue or the neck of the crater may be occluded by edema. Under such circumstances barium sulfate does not enter the crater and consequently it cannot always be demonstrated. On the other hand, barium lodged between mucosal folds or in a pocket of a deformed duodenal bulb may suggest a crater. Such collections of barium have been termed spurious craters. The ability to demonstrate crater and to differentiate between conditions which may simulate it varies with the skill of the roentgenologist and the technic he uses. The highest degree of success has been reported by those roentgenologists who use fluoroscopic examination combined with compression films made under fluoroscopic control.

Templeton and his co-workers reported the roentgenologic findings in over 850 cases of active duodenal ulcer. Crater was demonstrated in approximately 65 per cent of the cases. In 112 instances a crater was found in an undeformed bulb. It is of interest to note that in some patients with typical ulcer distress in whom there was no evidence of a lesion of the stomach at gastroscopic and roentgenologic examination, the duodenal bulb was termed normal, having no demonstrable deformity or crater. These observations are in agreement with those of other investigators that the failure to demonstrate a typical crater, duodenal deformity or both does not rule out the possibility of an active ulcer. It should be stressed, however, that in the great majority of cases of active duodenal ulcer an expert roentgenologist is able to demonstrate some evidence of ulcer. Dark red blood may be passed by rectum following hemorrhage from a duodenal ulcer. This is usually interpreted to indicate a massive hemorrhage with rapid passage of the blood through the intestinal tract. Unless it is known, however, that no coincidental lesion below the duodenum is present, it is not always certain that the source of bleeding is from the duodenal ulcer.

RESTORATION OF HAIR COLOR

To the Editor:—**It has been reported by reliable witnesses that the hair of a certain man became gradually gray to almost white till he reached the age of 48 years. He then became sick and remained so for two years until his death at 50. During the last two years of his life his hair turned gradually gray and black. At the time of death his hair was completely black. Are there any reports in the literature of a similar instance? No satisfactory explanation has been offered so far of the phenomenon of hair graying.**

Francesco Ronchese, M.D., Providence, R. I.

ANSWER.—Though the occurrence described is rare, similar cases have been recorded. The earliest discovered is that reported by V. C. Isdell (Case of the Restoration of the Natural Color of Human Hair After Having Been Gray for Several Years, *M. Times & Gaz.* **2**:680, 1884) of his father, Dr. James Isdell of Dublin, who in 1861 at the age of 62 had completely gray beard and scalp hair. In 1882 at the time of his death his scalp hair was its natural dark color except for a few gray hairs on the temples. Between these dates he had led a normal life and had had no illnesses.

G. T. Jackson and C. W. McMurtry (Diseases of the Hair, Philadelphia, Lea & Febiger, 1912, p. 60) cite a case reported by Dr. Warner. A man with black hair and beard experienced sudden loss of the color from his beard and scalp hair, then during the next five years a return of the color to normal. After a few years the beard and scalp hair suddenly became gray again and then gradually regained their color. This same change occurred a third time within thirty years from the first loss of color. During all this time there was no ill health or use of hair dyes.

G. W. Griffiths (Report of a Case in Which the Hair Turned from White to Black After Exposure to Extreme Cold, *J. Cutan. & Genito-Urin. Dis.* **13**:376, 1895) records the case of a fireman aged 65 who had had gray hair for eight years. He had been blond. At a fire he was exposed to severe cold for a long time, an icy wind blowing the spray from a leaky fire hose on him. During this time his scalp was the warmest part of his body, protected by a worsted skull cap under his helmet. Twenty-four hours later his hair turned black.

Fred Wise and M. B. Sulzberger (Acquired Progressive Kinking of the Scalp Hair, Accompanied by Changes in Its Pigmentation, *Arch. Dermat. & Syph.* **25**:99 [Jan.] 1932)

reported a case in which the hair of the left temporal region became kinky and black, contrasting sharply with his normal light brown, straight hair. Later the same change occurred on the right temporal, the right parietal and the right frontal regions. They call it a late nevoid change, though his attacks of severe pain followed by great tenderness of the scalp and accompanied by diplopia gave reason to suspect disease of the brain. No proof of this was found.

P. Rostock (Seltene Haarpigmentierung nach Roentgenbestrahlung, *Strahlentherapie* **28**:800, 1928) cites his case of brain tumor, which was treated by roentgen rays after a trephining had disclosed no evidence of superficial involvement of the brain. Three areas were treated, both parietals and an occipital field. Epilation ensued on each field and the hair that grew on the right parietal and occipital areas was of the normal blond shade; but on the left parietal area the new hair, three months after the last roentgen exposure, was quite dark. Microscopically it was thicker and contained more pigment and more air than the normal hair.

The case of the fireman exposed to cold suggests the experimental work of W. Schultz (Haarmelaninerzeugung bei Albinos innerhalb fünf Minuten unter dem Mikroskop under Weiteres zur kälteschwärzung von Haar, Haut und Auge, *Arch. f. Dermat. u. Syph.* **165**:405, 1932), who used newborn Russian albino rabbits, a race which has black noses, feet, ears and tails. They are classified as acromelanotic albinos. If these young animals are kept cool after the hair has been plucked or shaved from a patch of skin, the hair of this area grows in black. At birth the nose, ears, feet and tail are white but, being cooler than the rest of the skin, turn dark. If these parts are plucked and kept warm, white hair grows on them. Schultz says that human beings who have black hair and blue eyes correspond to some degree to these partial albino rabbits.

B. Bloch (Ueber die Entwicklung des Haut und Haarpigmentes beim menschlichen Embryo und über des Erlöschen der Pigmentbildung im ergrauenden Haar (Ursache der Canities), *Arch. f. Dermat. u. Syph.* **135**:77, 1921) studied the skin of the scalp of gray haired persons by means of the dopa reaction, which indicates the cells capable of pigment production. He found that pigment producing cells become fewer and fewer as grayness increases and finally disappear. He favors the theory that the dark hair is shed and replaced by one with less pigment producing capacity, until finally all are white.

It is evident that the pigment producing capability of the skin can be temporarily suppressed in certain individuals. It seems probable that ordinary graying of the hair takes place as Bloch suggests, by replacement of the pigmented hair by a white one. Sudden graying, on the other hand, may be due not alone to the entrance of air into the medulla of the hair but also to a chemical bleaching action of toxins due to shock or violent emotion. This would occur more easily in those whose pigment precursors are weak, as in the race of rabbits used by Schultz. The restoration of color may occur in the same type of individuals in which the pigment producing capacity was not destroyed, but only in temporary abeyance.

SULFANILAMIDE AND ANTISERUM FOR DRUG ADDICTION

To the Editor:—**In treating drug addicts I have recently discovered that administration of a small amount, say 15 to .20 grains (1 to 1.3 Gm.) daily of sulfanilamide not only prolongs the therapeutic effects and apparently does not increase tolerance but also alleviates the common unpleasant withdrawal symptoms. I should like to know if this experience has ever been corroborated. If this can be established as a clinical fact, the new drug might well be a better remedy than anything we have had for this clinical entity. I hit on this therapeutic measure from the hypothesis that drug addiction is somewhat analogous to bacterial infection, resulting in antibody formation and obeying laws of immunity. If the premise is correct, then immune serum can be used to a greater advantage. By narcotizing and gradually denarcotizing a laboratory animal and killing it at the proper moment, serum may be obtained for the treatment of the addict. I should like to know if experimental medicine similar to the described method has ever been employed.**

M.D., Washington.

ANSWER.—The use of sulfanilamide in the detoxication of drug addicts may have value in the alleviation of the withdrawal symptoms during the treatment of drug addicts. Because of the untoward effects of sulfanilamide when administered to patients in poor nutritional condition one would consider it an unsafe drug to give to drug addicts, who, when suffering with strong addiction, are always in a poor nutritional state of health.

Carlo Gioffredi (L'immunité artificielle par les alcaloïdes, *Arch. ital. de biol.* **28**:402, 1897) produced morphine addiction in 1 dog. The addicted dog serum in doses of 20 to 30 cc. produced a protection of 2 minimal lethal doses in dogs.

Leo Hirschlaff (Ein Heilserum zur Bekämpfung der Morphiumvergiftung und ähnlicher Intoxicationen, *Berl. Klin. Wchnschr.* **39**:1174-1177, 1902) had the same idea as that outlined in the production of an antiserum for the disintoxication of morphine addicts.

Hirschlaff produced addiction to morphine in rabbits and tested the antitoxin contents of the rabbit serum on white mice. Thirteen mice received 1 cc. of normal rabbit serum; twenty-four hours later they were given the minimal lethal dose of morphine and 9 of them died.

One cc. of the habituated serum administered twenty-four hours before giving 3 to 4 minimal lethal doses of morphine protected all of 21 mice from death.

Hirschlaff used the habituated rabbit serum in 5 cc. doses in treating the withdrawal symptoms of 5 morphine addicts. He was of the opinion that their withdrawal symptoms were somewhat reduced.

This type of treatment never became popular because in successful disintoxication of drug addicts there are no withdrawal symptoms or other discomforts.

INTESTINAL AND LIVER FLUKES

To the Editor:—**I will be grateful for any information regarding infection with Fasciolopsis buski or Fasciola hepatica, or any references to recent articles on this subject. Could you give me information on the following questions? Are there any methods aside from the examination of the stool for determining the exact type of parasite? Is there any specific treatment for either of these parasites in human beings? Can infection with these parasites give the picture of a completely nonfunctioning gallbladder by the gallbladder dye test?**

Fred M. Anderson, M.D., Carson City, Nev.

ANSWER.—Fasciolopsis buski, the large intestinal fluke, has a thickness of approximately 2 mm. and varies in length between 2 and 7.5 cm. and in width between 8 and 20 mm. It has a fairly wide distribution, extending from central China south to Borneo and Sumatra and up into Bengal and Assam. In areas in which it is endemic it is a common parasite of man and pigs, rarely of dogs. Infection is acquired from consuming raw aquatic plants to the underground and aboveground parts of which the fluke, in the encysted larval stage, is attached. The adult worms usually become attached to the mucosa of the duodenum and the proximal portions of the jejunum. Large numbers of these worms may produce intestinal obstruction, but a major symptom is generalized toxemia due to the absorption of by-products of the worms. Fasciola hepatica, the common sheep liver fluke, has a fairly cosmopolitan distribution throughout the moist and irrigated areas of the world wherever sheep are raised. It is a large, relatively flat, leaflike worm measuring up to 30 mm. in length by 13 mm. in breadth. Apparently all mammals which consume raw aquatic vegetation to which the encysted larval stage is attached are susceptible to infection. Although there have been several hundred cases of human infection reported in South America, the West Indies, southern and southeastern Europe, northern Africa, the Near East, Russia and China, and although sheep in the southern and western parts of the United States are infected, endemic infection in human beings has not been found in the United States. The young worms migrate through the hepatic parenchyma to the larger bile ducts and the gallbladder, in which they mature. Damage produced by this worm is both traumatic (i. e., "liver rot"), because of the migration of the immature worms, and toxic.

The eggs of the two species of worms are large, transparent, gray ovoid objects and possess a minute operculum (cap) at one end. They are extremely difficult to distinguish one from another on the basis of structure and look identical when passed in feces or removed by duodenal aspiration. However, if biliary aspiration is undertaken, eggs present in B bile would undoubtedly be those of Fasciola. This constitutes the only certain ready method of pretreatment diagnosis outside of areas in which one or the other of the two species of worms is known to be exclusively endemic.

There is a specific treatment for infection with Fasciolopsis. Originally betanaphthol was prescribed and was administered in the amount of 0.2 Gm. in each of two divided doses. A decade and a half ago carbon tetrachloride, administered as in hookworm disease, came into use and was found to be specific but relatively toxic. In 1937 McCoy and Chu tested caprokol (hexylresorcinol crystoids) and found this anthelmintic to be both efficient and relatively nontoxic. For children from 1 to 7 years of age they gave 0.4 Gm. (in 0.2 Gm. hard gelatin capsules) in a single dose on a fasting stomach; children of school age and older persons were given a full gram. They produced 54 per cent cures among 129 cases and a distinctive reduction in the number of worms in an additional 23 per cent of their cases. Fasciola has been subjected to a consid-

erable number of drugs, most of which have been inefficient or too toxic for human beings. In 1932 Kouri and Arenas in Cuba published a report on their apparent success with emetine hydrochloride administered intramuscularly in the amount of 0.03 Gm. daily for seventeen to eighteen days. Later reports by Kourí and his colleagues and by Rodriguez-Molina and Hoffman (1938) in Puerto Rico indicated the apparent relative specificity of emetine hydrochloride for Fasciola.

It is unlikely that Fasciolopsis would produce a picture of disease of the gallbladder. Symptoms or signs recorded for cases of fascioliasis in human beings include hepatic colic, with coughing and vomiting; generalized tympanic abdominal rigidity, with pain on pressure; allergic manifestations; moderate to well defined eosinophilia; irregular fever, and more or less persistent diarrhea. It is conceivable that a large number of liver flukes living in the gallbladder might produce the picture of a "completely nonfunctioning gallbladder." Cases of infection of the type have not been reported in the literature, since human infection, even though clinically important, is usually light in the burden of worms as compared with infection in sheep and other herbivorous animals.

RAPIDLY DEVELOPING DENTAL CARIES

To the Editor:—**A white man aged 35 has been visiting his dentist twice a year for a number of years. He had been advised by his dentist that eighteen cavities had developed in his teeth since examination six months before. On questioning, it was found that he was not eating a balanced diet. He was advised in this respect and given dicalcium phosphate with viosterol and cod liver oil and was told to drink a quart of milk a day. His blood calcium level was reported to be 7.8 mg. per hundred cubic centimeters by a reliable laboratory; on Dec. 28, 1938, the level was 8.2 mg. per hundred cubic centimeters and on May 25 it was 8.8 mg. per hundred cubic centimeters. He was also given decholin. In February 1941 he again visited his dentist who advised him that twenty-one additional cavities had appeared since the last examination. Physical examination of this person shows him to be apparently otherwise normal. Any suggestion that you can offer concerning treatment will be greatly appreciated.**

M.D., Florida.

ANSWER.—Caries is a bacterial disease which depends largely on local oral factors such as accumulation of food débris, enzymes which promote or inhibit bacterial action, the character of food in so far as it is fermentable or promotes bacterial activity, and the saliva. The role of systemic factors in the production of caries is not understood. Systemic therapy has therefore not been scientifically established. The lowered calcium level of the patient's blood calls for diagnosis and treatment. While a low calcium level may conceivably affect the buffer action of saliva, it is not likely that it is related to the high susceptibility to caries. Disturbances in calcium metabolism have not been shown to be significant in caries. Treatment, therefore, should consist of the removal of the carious lesions and the restoration of the lost portions.

Unfortunately, treatment other than dental restorations is not known. It is important that free fermentable carbohydrates be eliminated from the patient's diet and that oral hygiene be followed.

IMMUNIZATION OF AN INFANT WITH ECZEMA

To the Editor:—**An infant aged 6½ months has had eczema since he was 2 months of age, despite different diets and treatments. For the past six weeks he has received sobee and water and synthetic vitamins D, C and B only, with no apparent change. The condition almost clears up at times, but always recurs; otherwise he is in good health. Would it be safe to begin immunizing him against whooping cough, diphtheria and scarlet fever? Are many infants given tetanus toxoid with the diphtheria toxoid? Is the procedure safe for a baby with eczema or other allergy? Many physicians no longer immunize children against scarlet fever, as sulfanilamide takes care of the infection quickly. What do you think?**

M.D., Illinois.

ANSWER.—If the child's general condition is good there is no objection, despite the presence of eczema, to active immunization for whooping cough, diphtheria and tetanus. It is probably wisest to start the immunization procedures for whooping cough first. If the local reactions are severe or if general reactions occur (fever, malaise), the dose with each injection may be halved and the number of weekly injections increased. It is advisable, with allergic children especially, to wait until all induration at the site of the previous injection has disappeared before another injection is given. A rest period of at least several months should be given before starting immunization with combined diphtheria and tetanus toxoids. Here again it may be advisable to decrease the amount given with each dose and increase the number of injections.

Many pediatricians do not consider immunization for scarlet fever advisable, except for those who are subject to frequent exposures (nurses, physicians in hospitals for contagious diseases). The reactions observed in scarlet fever immunization are apt to be severe. In a brochure issued as a "Report of the Committee on Immunization and Therapeutic Procedures for Acute Infectious Diseases of the American Academy of Pediatrics" (page 17), the following statement is made: "Most of the committee feel that scarlet fever immunization cannot be put in the same class with diphtheria immunization."

DERMATITIS AND DUCO PRODUCTS

To the Editor:—**I should like to have some information or references on the subject of industrial dermatitis due to Duco.**

R. F. Mueller, M.D., Two Harbors, Minn.

ANSWER.—Duco is the trade name given by DuPont to a series of products which include cleaners, putties, furniture lacquers, linoleum finishes, lacquer thinners, household cement, automobile lacquers, sign finishes and stencil pastes. The Duco lacquers are pyroxylin base finishes containing pigment. Pyroxylin consists of either cellulose nitrate or cellulose acetate combined with camphor and plasticizers such as tricresyl, dibutylphthalate and the like dissolved in a combination of solvents, such as the esters mixed with various alcohols, petroleum and coal tar derivatives. In order to determine the ingredients going into the Duco which caused the dermatitis, one would have to know the exact name of the product as printed on the container. Dermatitis from paints, varnishes and lacquers is usually caused by the volatile solvent or thinner if the dermatitis occurs from handling the wet product; but if the dermatitis occurs from handling the hard, dry paint or lacquer, then the plasticizers or the dyes are usually at fault, just as dermatitis of the face caused by nail polishes is due to hypersensitivity to the dye or plasticizer used in the nail polish and not to the solvent, which has completely evaporated from the nails.

SWEATING IN AURICULAR FIBRILLATION

To the Editor:—**A patient aged 70 with chronic auricular fibrillation complains of uninterrupted night sweats of a drenching nature. I have been unable to control them. Atropine and vitamin concentrates in large doses have failed. Will you advise me of any remedy which will stop this annoying and debilitating process?**

M.D., Pennsylvania.

ANSWER.—The relief of this distressing symptom has never been easy. Even the exact mechanism involved in this type of sweating is not well understood. It is assumed that there is a certain atony of the sweating mechanism due to debilitated states. Hence the fundamental treatment is improvement of the general physical condition. Vitamin concentrates will tend to do this. Aminoacetic acid might be helpful.

Atropine is usually the best of all the remedies recommended for patients with auricular fibrillation and sweating. Tellurium enjoyed a vogue some years ago and was said to be as useful as atropine. It was abandoned, apparently because of the garlic odor that it imparts to the breath. Strangely enough, pilocarpine in subtherapeutic doses has been recommended in cases in which atropine fails. The dose should not exceed $\frac{1}{20}$ grain (0.003 Gm.) hypodermically, and even this must be used with care for a patient with chronic heart disease. The presence of auricular fibrillation suggests that the patient may be receiving digitalis. If so, omission of the digitalis might have a beneficial effect on the sweating.

RECTAL DILATORS

To the Editor:—**What are the indications for using rectal dilators for mild hemorrhoids? How and when should they be used? Should they be used before or after defecation? Should use be restricted to the smallest size only as long as it is effective, then taking a larger size, or should one after another throughout the series be used from the beginning? Manufacturers state that they should be used on the direction of a physician, but the textbooks fail to direct the physician, either ignoring the subject altogether or merely stating briefly that they may sometimes be useful.**

M.D., Texas.

ANSWER.—Rectal dilators are not of much help in the care of mild hemorrhoids. The only important thing that should be observed is absence of strain at bowel movement and immediate reduction of the protrusion into the rectum following bowel movements. If a dilator is used it would only be to accomplish the purpose of pressing the blood out of the varicose veins, and the small dilator is just as effective for this purpose as a large one. The rectum cannot be dilated beyond its physiologic normal size without causing severe pain, and therefore rectal dilators are not used for this purpose in the treatment of hemorrhoids.

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HIS FIRST CEREAL FEEDING

The baby's first solid food always excites the parents' interest. Will he cry? Will he spit it up? Will he try to swallow the spoon? Far more important than the child's "cute" reactions is the fact that figuratively and physiologically this little fellow is just beginning to eat like a man.

IT is a fortunate provision of Nature that at the time the infant is ready to receive the nutritional benefits of cereal, his taste is unspoiled by sweets, pastry, condiments, tobacco, alcohol and other things to which adult palates and constitutions have become conditioned.

Many a parent, with limited knowledge of nutrition, attempts to do the baby's tasting for him. Partial to sweets, the mother sweetens her child's cereal. Disliking cod liver oil, she wrinkles her nose and sighs: "Poor child, to have to take such awful stuff!" The child is quick to learn by example, and soon may become poor indeed—in nutrition, as well as in mental habits and psychological adjustment.

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